Drives, motors and mechanical power transmission catalogue 2014

Power and productivity
for a better world™

ABB drives and motors quickfinder

Select a drive or motor using the quick criteria below

Supply voltage							Motor power kW	IP rating	Drive family	Drive type
110-120V 1ph	200-240V 1ph	208-240V 3ph	380-480V 3ph	380-415V 3ph	500V 3ph	690V 3ph				
●							0.18 - 0.37 (ACS55) 0.18 - 2.2 (ACS55) 0.37 - 2.2 (ACS150) 0.37 - 2.2 (ACS150) 0.37 - 4.0 (ACS150)	IP20 (ACS55) IP20 (ACS150) NEMA1 (ACS150)	ABB micro drives	ACS55 and ACS150
	●						0.37 - 2.2 0.37 - 11.0 0.37 - 22.0	IP20 NEMA 1 IP66/69k	ABB machinery drives	ACS355
	●						0.37 - 2.2 0.37 - 11.0 0.37 - 22.0	IP20 NEMA 1	ABB general purpose drives for fans and pumps	ACS310
		●					0.75 - 75 1.1 - 180 200 - 355	IP21, 54 IP21, 54 IP20	ABB general purpose drives	ACS550
		●					0.75 - 75 1.1 - 180 200 - 355	IP21, 54 IP21, 54 IP20	ABB drives for HVAC	ACH550
			●				1.1 - 160 200 - 400	IP20 IP00	ABB drives for water and wastewater	ACQ810
		●		●	●	●	0.55 - 55 1.1 - 160 1.5 - 200 5.5 - 160	IP20,21,55	ABB industrial drives - wall-mounted unit 01 - 6/12-pulse diode 11 - active 4Q regenerative 31 - active low harmonic	ACS800 - 01/11/31
		●		●	●	●	0.37 - 200 90 - 1450 110 - 1850 90 - 1900	IP00, 21	ABB industrial drives - module 02 - floor standing 04 - module for cabinets 14 - active low harmonic kits	ACS800 - 02/04/14
				●	●	●	45 - 1450 55 - 1850 45 - 2800	IP21, 22, 42, 54, 54R	ABB industrial drives - cabinet-built 07 - 6-pulse diode 17 - active 4Q regenerative 37 - active low harmonic	ACS800 - 07/17/37
		●	●	●	●	●	1.1 - 5600	Various	Other ABB industrial drives variants	ACS800 - the rest of the family
		●		●	●	●	0.55 - 7.5 0.55 - 250 0.55 - 250 4 - 250	IP21, IP55	Next generation of ABB industrial drives - wall mounted 01 - 6-pulse diode	ACS880 - 01
				●	●	●	250 - 1400	IP20	04 - 6 pulse diode	ACS880 - 04
				●	●	●	45 - 1400 45 - 1300 45 - 2800	IP21, 42, 54	Next generation of ABB industrial drives - cabinet drive 07 - 6/12-pulse diode	ACS880 - 07
		●	●	●	●	●	0.55 - 250	Various	Next generation of ABB industrial drives	ACS880
Medium voltage AC drives							315 kW- 35 MW 2 MW - 72 MW	Various	ABB medium voltage AC drives	ACS1000 - ACS6000 LCI megadrive
Low voltage DC drives and power quality filters							25 A - 5.2 kA	Various	ABB DC drives and power quality filters	DCS400 - DCS600, PQF

	Motor power kW	IP rating	Motor family	Motor type
ABB motors	0.25 - 1000	IP55/56/65	ABB general performance motors ABB process performance motors ABB hazardous area motors - flameproof ABB hazardous area motors - non sparking NEMA motors	M2AA, M2BA M3AA, M3BP M3JP/KP M3GP NEMA standard

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European MEPS for low voltage motors	64
Useful engineering information and how to select an AC drive	94 - 95

Brief description	Why choose this product?		Pages
ACS55 - Simplest variable-speed controller. No programming – set-up via DIP switches – ACS150 - Greater capability than ACS55 with simple keypad and built-in potentiometer. Simple parameter set that includes PID control. For OEMs and machine builders.	ACS55 - Allows users of direct-on-line (DOL) starting methods to swap to variable-speed control. ACS150 - More capable parameter set allows many applications to be tackled including PID. Built-in keypad and programming in the box. Unified height and depth for easy cabinet layout.		10 - 14
Machinery controller with safe torque-off to SIL3/PL e capable parameter set - includes eight-step sequencer. For OEMs and machine builders, especially food & beverage industry.	Designed for machinery applications, with assistant keypad and real-time clock. Feedback devices and fieldbus available. IP66 drives meet hygiene standards for food & beverage industry		15 - 18
Dedicated drive for fans and pumps, with quadratic motor fluxing and energy optimisers to optimise fan and pump loads. For fan and pump OEMs and water & wastewater applications.	Assistant or simple keypad – dedicated pump features. Pump protection, cleaning and pipe fill features. Energy saving counters, fan PID controllers with “sleep” functionality.		19 - 22
Drive equipped with EMC and harmonic filters. The extensive parameter set, vector control and high power density, allows the drive to fit most standard variable-speed drive applications.	Assistant keypad makes it user-friendly - numerous standard software functions and macros. Real-time clock. Energy monitoring and energy optimising with everything inside.		23, 24 27, 28
Dedicated industry drive for HVAC applications. Industry specific HVAC functionality, such as fireman’s override are included as well as HVAC set-up macros and HVAC keypad controls. BACnet is also embedded as standard in the drive as a BMS communications protocol.	Familiar HVAC assistant keypad matches industry expectations. Dedicated HVAC functionality and HVAC harmonic specifications make it ideal for the industry. Everything inside concept makes it easy to install and energy monitoring counters allows energy usage to be passed back over the BACnet link.		25 - 28
Dedicated industry drive for water and wastewater using direct torque control (DTC) motor control to optimise control and energy use. Safe torque-off to SIL3 means no contactors.	Expert control of pumping applications. Multi-pump and multi-master control. Automatic duty standby and pump cleaning and level control built-in. Drives also measure flow for built-in leak detection.		29 - 32
Drives are order based expert drives for highly demanding industrial applications. DTC motor control ensures peak performance. Wall-mounted variants are available, with differing rectifier technologies and built-in options.	Standard rectifier, low harmonic or full regeneration can be chosen, then select from a wide range of I/O and feedback options. To complete the selection, drives can be ordered with pre-loaded industry specific software versions which allow quick integration onto winders, cranes, hoists and windmills. Suitable certification also available.		33, 34 35, 39 40
Modules are drives that are optimised for cabinet installation by system integrators. The routing of cables from top in to bottom out, and the position of options and DC feeding have all been considered for optimal cost effective cabinet integration.	Modules are fully supported with CAD databases, EPLAN libraries, with Rittal and generic kits and parts for quick cabinet installation.		33, 36
Cabinet drives are designed, built and tested at the factory and can be ordered with a large range of standard options. Door furniture, motor protection and various cooling variants are possible.	Cabinets are fully tested and certified EMC with thermal solutions. Extensive options available.		33, 38 39, 40
The ABB drive family contains liquid-cooled modules, multidrives and multidrive modules and many more.			41 - 42
Next generation of the ACS800 range. New keypad, PC tools and innovations in usablity and hardware design. New PC tools and enhanced motor control complete the package.	Drives built to order in the factory. The ACS880 is the next generation of ABB industrial drive. ACS800 is still available as the ACS880 only brings some of the variants available with the ACS800.		44 - 47
Wheeled drive modules optimised for cabinets.	2014 extends the range to multidrives and drive modules.		48 - 49
Next generation of the ABB industrial drives cabinet drive. Cabinet drives are designed, built and tested at the factory and can be ordered with a large range of standard options. Door furniture, motor protection and various cooling variants are possible.			44, 45 50, 51
Other variants of this new family, including multidives and multidrive modules.			52 - 55
ABB is able to provide medium voltage drives and motors to suite many applications and industry requirements. Air-cooled and water-cooled variants available, as well as integrated transformer solutions. Standard solutions up to 35 MW with modular power sections for lower mean time to repair (MTTR). LCI megadrives take the power offering to 72 MW.			56 - 57
ABB provides DC drive and motor packages via its dedicated DC partners. ABB also provides power quality solutions to ensure that drive installations comply to the rigours of G5/4 and G5/5.			57 - 58
Remote monitoring options and PC tools for drive commissioning and energy calculations.			59 - 61
Drive life cycle services - and ABB University training centre.			62

	63 - 91

ABB drives featurefinder

The table highlights the differences between the various ABB drives families. It also lists some of the key features of the different ABB drives. However, the table is not exhaustive and if you are seeking a feature which does not appear in the table, please contact ABB for clarification.

Drive range		ABB micro drives (ACS55 - p10) (ACS150 - p12)	ABB machinery drives (ACS355 - p15)	ABB general purpose drives for fans and pumps (ACS310 - p19)
Voltage & power	**Details or additional notes**	(ACS55) 1-ph 100 - 120 V: 0.18 - 0.37 kW 1-ph 200 - 240 V: 0.18 - 2.2 kW (ACS150) 3ph 380 - 480 V, 0.37 - 4.0 kW	1-ph 200 - 240 V: 0.37 - 2.2 kW 3-ph 200 - 240 V: 0.37 - 11 kW 3-ph 380 - 480 V: 0.37 - 22 kW	1-ph 200 - 240 V: 0.37 - 2.2 kW 3-ph 200 - 240 V: 0.37 - 11 kW 3-ph 380 - 480 V: 0.37 - 22 kW
Other rectifier options (assume 6-pulse as standard)	12-pulse diode	-	-	-
	Low harmonics regenerative (4Q)	-	-	-
	Low harmonics non-regenerative (2Q)	-	-	-
	Common DC link connectability	-	●	-
EMC compliance (EN 61800-3, 2004)	No EMC filter	● (or remove EMC screen)	● (remove EMC screw)	● (remove EMC screen)
	2nd unrestricted (C3)	●	●	●
	1st restricted (C2)	■ (ACS150)	■	■
	1st unrestricted (C1)	●,- (ACS150)	-	-
Harmonic filter / choke / active (EN 61000-3-4)	Choke (AC or DC)	■	■	■
	Swinging choke (better harmonic performance)	-	-	-
	Low harmonic (best performance)	-	-	-
Enclosure class	IP00	-	-	-
	IP20	●	●	●
	IP21 (or near equivalent)	❍ (Nema 1, ACS150)	❍ (Nema 1)	❍ (Nema 1)
	IP22	-	-	-
	IP42	-	-	-
	IP54/ IP54R/ IP55	-	-	-
	IP66/69K	-	●	-
Mechanical construction	Module - panel mountable (IP20 minimum)	●* (DIN mount + screw)	●* (DIN mount + screw)	●* (DIN mount + screw)
	Wall-mounted (IP21 or equiv. minimum)	❍ (Nema 1, ACS150)	❍ (Nema 1 kit)	❍ (Nema 1 kit)
	Free-standing, floor-standing	-	-	-
	Cabinet built by ABB	-	-	-
Cooling method	Direct air-cooling	●	●	●
	Water-cooling	-	-	-
	Through panel/flange mount	-	-	-
Dynamic braking chopper	Range of resistors available from ABB	-(ACS55), ● (ACS150)	●	-
Switching frequency		4 to 16 kHz	4 to 12 kHz	4 to 16 kHz
Motor control	DTC (open/closed loop)	-	-	-
	Sensorless vector	-	●	-
	Scalar, VVVF	●	●	●
Programmability	Parameter programming	uses dip (ACS55), ● (ACS150)	●	●
	Adaptable programming	-	● (sequencer)	-
	IEC61131 programmability	-	-	-
Start-up assistance and help	Aids to commissioning and diagnostics	-	● (assistant panel)	● (assistant panel)
Cold configure	Program the drive whilst still in its box	●	●	●
Removable memory module	No recommissioning time needed	-	-	-
Real-time clock	With assistant control panel	-	●	●
I/O built-in	Analogue input/output	1 / 0	2 / 1	2 / 1
	Digital input/output	3 / 1r (ACS55), 5 / 1r (ACS150)	5 / 1r+1t+(3r)	5 / 1r+1t+(3r)
	Speed feedback (encoder)	-	❍	-
( ) = via add on expansion module	Motor thermal protection	-	❍ configurable	❍ configurable
	STO (safe torque-off)	-	●	-
+24V live control panel + comms	External 24V supply can be connected	-	● (MPOW)	-
Fieldbuses	Modbus	-	❍	●
	Fieldbus interface (popular networks)	-	❍	-
	Drive-to-drive link	-	-	-
	BACnet	-	-	-
Remote monitoring	Report info and status remotely	-	■ (SREA)	■ (SREA)
Safety options (TÜV certified hardware)	Emergency stop (CAT.0, CAT.1)	-	-	-
	Safe torque-off (SIL2/PL d)	-	-	-
	Safe torque-off (SIL3/PL e)	-	●	-
	Dedicated safety module	-	-	-
ATEX	ATEX certified for use with ABB motors	-	● Ex tD and DIP only	-
PC tools	DriveConfig tool (programme in box)	■ (ACS55), - (ACS150)	-	-
	DriveWindow Light	-	■	■
	DriveWindow	-	-	-
	DriveAP	-	-	-
	DriveStudio (IEC 61131)	-	-	-
	Drive Composer (Entry or Pro)	-	-	-
Industry specific products	HVAC specific	-	-	-
	Food and beverage	❍	●	❍
	Machinery / OEM	●	●	●
	Water and wastewater	-	❍	❍
	Industry specific applications FW	-	● (IP66/69) F&B	●

● = standard ❍ = option, internal or fitted ■ = option, external - = not available * = can be bookcase or flat mounted r = relay output, t= transistor output, c = configurable to be input or output,

ABB general purpose drives (ACS550 - p23)	**ABB drives for HVAC** (ACH550 - p25)	**ABB drives for water and wastewater** (ACQ810-04 - p29)	**ABB industrial drives and drive modules** (ACS800-01,-02,-04,-11,-14,-31 - p36)	**ABB industrial drives cabinet-drive** (ACS800-07, 17, -37 - p37)	**ABB industrial drives (next generation)** (ACS880-01, 04, 07 - p44)
3-ph 208 - 240 V: 0.75 - 75 kW 3-ph 380 - 480 V: 1.1 - 355 kW	3-ph 208 - 240 V: 0.75 - 75 kW 3-ph 380 - 480 V: 1.1 - 355 kW	3ph 380 - 480 V: 1.1 - 400 kW	3-ph 230 V: 0.55 - 200 kW 3-ph 400 V: 1.1 - 1450 kW 3-ph 500 V: 1.5 - 1850 kW 3-ph 690 V: 5.5 - 1900 kW	- 3-ph 400 V: 45 - 1450 kW 3-ph 500 V: 55 - 1850 kW 3-ph 690 V: 45 - 2800 kW	3-ph 230 V: 0.55 - 75 kW 3-ph 400 V: 0.55 - 1400 kW 3-ph 500 V: 0.55 - 1400 kW 3-ph 690 V: 4 - 2800 kW
-	-	-	❍ (>400 kW)	❍ (>400 kW)	-
-	-	-	● (800-11, 800-14)	● (800-17)	-
-	-	-	● (800-31)	● (800-37)	-
-	-	-	●	●	●
● (remove EMC screw)	● (remove EMC screw)	❍	● (remove EMC screw)	● (remove EMC screw)	● (remove EMC screw)
●	●	●	●	●	●
●	●	❍	❍, ■ (800-04 R7/8)	❍	❍
■	■	-	-	-	-
-	-	●, ■ (A,B Frame)	●	●	●
●	●	-	-	-	-
-	-	-	● (800-31)	● (800-37)	-
-	-	● (G frame)	● (800-04, R7/R8, 800-14)	-	-
-	-	● (A-E frame)	● (800-04, R2 - R6)	-	● (-04)
●	●	● (G1/G2 frame)	● (800-01, -02, -11, -31)	●	● (-01)
-	-	-	-	❍	● (-07)
-	-	-	-	❍	❍ (-07)
❍ (IP54)	❍ (IP54)	-	❍ (800 -01, -11, -31) IP55	❍	❍ (-01, 07)
-	-	-	-	-	-
●	●	●	● (800-04*)	-	● (-04)
●	●	-	●	-	● (-01)
● (550-02)	● (550-02)	-	● (800-02)	●	-
-	-	-	-	●	● (-07)
●	●	●	●	●	● (Fan variable speed)
-	-	-	-	● (LC range)	-
❍ (IP54 drive)	❍ (IP54 drive)	-	❍ (800-04)	-	-
● (to 11.0 kW), ■ thereafter	● (to 11.0 kW), ■ thereafter	-	❍	❍	❍
4 to 12 kHz	4 to 12 kHz	DTC	DTC	DTC	DTC
-	-	●	●	●	●
●	●	-	-	-	-
●	●	●	●	●	●
●	●	●	●	●	●
-	-	●	● (Drive AP)	● (Drive AP)	future
-	-	●	-	-	future
● (assistant panel)	● (assistant panel)	●	●	●	●
●	●	-	-	-	-
-	-	●	-	-	●
●	●	●	-	-	●
2 / 2	2 / 2	2+(3) / 2+(1)	3+(2) / 2+(2)	3+(2) / 2+(2)	2+(3) / 2+(1)
6 / 3r+(3r)	6 / 3r+(3r)	6+2c+(4) / 2r+(2r)	7+(6) / 3+(6r)	7+(6) / 3+(6r)	7+(4) / 3r+(2r)
❍	❍	-	❍	❍	❍
❍ configurable	❍ configurable	❍ configurable	❍ configurable	❍ configurable	❍ configurable
-	-	●	❍	❍	●
-	-	●	●	●	●
●	●	●	❍	❍	●
❍	❍	❍	❍	❍	❍
-	-	●	❍	❍	●
-	●	-	-	-	-
■ (SREA)	■ (SREA)	■ (SREA)	■ (RETA)	■ (RETA)	■ (RETA or SREA))
-	-	-	-	❍	❍
-	-	-	■	❍	❍
-	-	●	-	-	●
-	-	-	-	-	❍
● Ex nA, Ex d/de,Ex tD/DIP only	-	-	●	●	-
-	-	-	-	-	-
■	■	-	■ (NPCU req.)	■ (NPCU req.)	-
-	-	-	■ (RDCO req.)	■ (RDCO req.)	-
-	-	-	■ (RDCO req.)	■ (RDCO req.)	-
-	-	■	-	-	-
-	-	-	-	-	■
-	●	-	-	-	-
❍	❍	-	❍	❍	-
-	❍	-	❍	❍	-
-	-	●	❍	❍	-
-	●	●	xx ❍	xx ❍	-

All ABB drives are CE marked
Other global approvals such as UL, cUL, CSA, C-Tick, GOST-R also applicable

xx = ACS800 can be loaded with industry specific code, like crane, winder, winch, spinning etc

++ = A wide range of encoder interfaces to suit high performance applications

ABB drives and motors

Welcome to the 2014 edition of the ABB drives, motors and mechanical power transmission catalogue. Here you will find the basic technical details and prices for our most commonly purchased products, together with their most widely selected options. However, our range of products, systems and services is far more extensive. Extracts from this additional range are given on pages 41-61.

Please do not hesitate to call us for any further information. Our contact details are on the back cover.

Thank you.

ABB drives and motors - matched packages

ABB is one of the few companies in the world to make low voltage AC drives and motors. As such ABB is able to offer the perfectly designed, tested and approved motor-drive combination for any demanding process.

ABB's AC drives are able to control AC motors over a power range from 100 W to 100 MW. ABB offers the lowest life cycle cost for each motor and drive, generating higher productivity and operating efficiency together with minimal environmental impact.

ABB also offers a totally new motor design. The SynRM motor brings a new dimension to high efficiency and performance. ABB offers this motor in two formats and with two drive products: IE4 motor or high output (HO) motor with either the ACS850 or the ACS880 making a dedicated machinery package (ACS850 + SynRM) or a dedicated industrial package (ACS880 + SynRM). More details can be found on page 8 and 9.

ABB Authorised Value Providers

Authorised Value Provider members deliver sales, support, service and engineering expertise in seamless cooperation with ABB. They bring ABB's products and services directly to your site.

Authorized value provider

ABB

Authorised Value Providers - Drives

These are the foremost drives network for the UK and Ireland. The 11 companies are strategically located around the UK and Ireland and have one of the largest stocks of AC drives, from 0.18 kW to 500 kW, available off-the-shelf.

Each provider is able to access up-to-the-minute central stock information using ABB's online service. The members of the team have been handpicked by ABB to offer outstanding expertise in their local area.

1. ACS Drives & Control Systems
   Ireland
   Tel: +353 (0)44 934 0242
2. APDS
   South West
   Tel: 0117 982 2049
3. Central Group
   Merseyside
   Tel: 0151 546 6000
4. EDC (Scotland)
   Scotland
   Tel: 0141 812 3222
5. Gibbons Engineering Group
   East Anglia
   Tel: 01621 868 138
6. Halcyon Drives
   Yorkshire and
   Greater Manchester
   Tel: 0113 236 1509
7. iDrives
   South East
   Tel: 01483 766 555
8. Inverter Drive Systems
   East Midlands
   Tel: 0115 944 1036
9. MKE Engineering Group
   South East
   Tel: 01795 438 436
10. Quantum Controls
    North East
    Tel: 01661 835 566
11. Sentridge Control
    Midlands
    Tel: 024 7655 3303

Authorised Value Providers - Motors

These are a network of 13 independent companies that have pooled their resources to offer national and local customer access to electric motors up to 500 kW. The providers offer extensive technical knowledge and back-up, combined with the best equipped repair and maintenance facilities in Europe. Customers benefit from common service standards throughout the UK, access to ABB's motor design and technical support, along with standardised reporting functions.

1. APDS
   South West
   Tel: 0117 982 2049
2. Beta Power Engineering
   Cheshire
   Tel: 0161 432 9995
3. Campbell Electric Motors
   Ireland
   Tel: +353(0) 1 4628 333
4. Central Group
   Merseyside
   Tel: 0151 546 6000
5. CovElec (Leics)
   Leicestershire
   Tel: 0116 269 8111
6. EDC (Scotland)
   Scotland
   Tel: 0141 812 3222
7. EMR Silverthorn
   Middlesex
   Tel: 020 8903 1390
8. H.G. Rewinds
   Staffordshire
   Tel: 01782 262525
9. Halcyon
   West Yorkshire
   Tel: 0113 236 1509
10. Heasell Electromechanical Services
    Hertfordshire
    Tel: 01763 243369
11. JJ Loughran
    Northern Ireland
    Tel: 028 8676 2295
12. MKE Engineering Group
    Kent
    Tel: 01795 438 436
13. Quantum Controls
    North East
    Tel: 01661 835 566

Call Authorised Value Providers on:
07000 ABB AVP (07000 222 287)

New in 2014 - ABB industrial drive, ACS880

Next generation ABB industrial drives, ACS880

The ACS880 power range and features have further increased. Power is now available up to 2800 kW in cabinet build. IP55 and IP21 ranges are now fully available.

The range is the first low voltage AC drive to use ABB's new common architecture that features the same control panel, harmonised parameters and functions, universal accessories and engineering tools. The architecture brings faster commissioning, minimal operator training and a familiarity across all ABB drives to be launched in the future.

The ACS880 family is available as a cabinet solution up to 2800 kW, with many factory factory fitted options.

ACS880 increases its range with multidrives and multidrive modules

The ACS880 range now includes factory-built multidrive cabinets and a wide range of multidrive modules. The cabinet offering includes active rectifier sections (ISU) up to 6000 kVA, diode rectifier sections (DSU) up to 5500 kVA and a new style low cost regenerative rectifier unit (RRU) up to 6000 kVA. The multidrive line ups can be configured with a large selection of inverter sections, braking sections and integrated options.

ABB offers a comprehensive range of multidrive modules which allow system integrators to build complex drive systems of their own. ABB's manuals and documentation and engineering tools provide comprehensive help to design and install the modules into either Rittal or bespoke cabinets

Safety built-in

The ACS880 offers integrated safety features, reducing the need for external safety components. Safe torque-off (STO) comes as standard, while options such as safe brake control (SBC), safe stop 1 (SS1), safe stop emergency (SSE) and safe maximum speed (SMS) are available when the dedicated safety module is installed.

Programming support

The new ABB industrial drives support the CoDeSys programming environment, the same software used for ABB's PLC, the AC500. This commonality allows easy integration of the drive and the AC500 PLC, since the control logic of the application can be designed using the same software, while some control logic can even be transferred from the PLC to the drive.

Accurate control of any motor type

Induction motors, synchronous motors and induction servo motors are all supported as standard by the drive, without any additional software. The latest motor design, SynRM (synchronous reluctance motor), is also supported by the ACS880 platform.

Next generation ABB industrial drive module, ACS880-04

The ACS880-04 modules, which are designed and manufactured for system integrators, have a new addition to the power range. The R10, R11 frames extend the power rating up to 500 kW at 500 V. The module is mounted on wheels for easy manual handling. Input cables come in at the top and motor output connects to the bottom. These areas are shrouded and the shrouds remain in place when the module is removed for maintenance. This module makes it easier for system integrators to incorporate large powers into their cabinets.

New in 2014

Synchronous reluctance motor and drive packages - power range extension

The SynRM motor range is further increased to include smaller motors:

– IE4 SynRM, cast iron frame sizes 160 to 315 (11 to 315 kW)
– High output (HO) SynRM, aluminium frame sizes 90 to 132 (1.1 to 37 kW), and cast iron frame sizes 160 to 315 kW (17 to 350 kW)

ABB's new, highly energy-efficient SynRM motor is an innovative motor design that has no rotor windings (no squirrel cage), unlike traditional synchronous designs. The rotor, therefore, suffers virtually no rotor power losses and the rotor temperature remains lower than in conventional rotors. This helps achieve better power density, higher energy efficiency and increased maintenance intervals. The SynRM has a high output (HO) variant that produces the same power as traditional asynchronous AC motors but in mechanical frames which are two sizes smaller. This HO variant boasts IE3 efficiency figures. The second super premium high efficiency variant has the same physical dimensions as a standard synchronous AC motor, but is able to achieve IE4 efficiency levels, which is ideal for minimising energy usage in fan and pump applications.

The SynRM motors bring many advantages over traditional motors including reduced lifetime costs, quieter running, longer greasing intervals and less heat in the control room.

The SynRM requires an ABB variable-speed drive to control the speed of the shaft. There are currently two matched packages. One includes an ABB industrial drive, ACS880, matched to either an IE4 or HO motor. The machinery package includes an ACS850 machinery drive matched to either an IE4 or HO motor.

AC500 safety PLC

AC500-S is the new safety PLC that fulfils the highest safety requirements and standards. The PLC is TÜV certified up to SIL3 (IEC 62061) and PL e (ISO13849). Separate safety and non-safety application programming provides flexibility and scaleability for customised solutions by using the complete AC500 CPU range. ABB's new AC500-S safety PLC sets new standards in the field of safety engineering by bringing an incredibly powerful set of functions for trigonometric operations, including COS, SIN, TAN, ASIN, ACOS and LOG. Integrating AC500 with ACS880 and other safety hardware from Jokab Safety, allows ABB to offer a full safety solution.

ABB Dodge bearings

Grip Tight® adapter ball bearings:

The Grip Tight adapter is shaft-ready right out of the box and offered in a variety of housing styles for normal and medium duty operations. With its patent pending pull/push adapter system, fully concentric 360º inner ring and completely interchangeable housing design, the Grip Tight adapter ball bearing is the easy-on/easy-off solution for damage-free shafting, reduced vibration and greater cost/inventory savings.

ISN bearings

An ineffective seal can allow contaminants to enter a bearing, which can cause failure. However, with ISN bearing inserts our proven Trident seals are extremely effective for dirty environments, low-to-medium speeds, and normal ambient conditions. For higher speeds and harsher ambient conditions, ISN inserts offer labyrinth seals with corrosion-resistant flingers and steel clearance seal carriers.

ABB micro drive

0.18 kW to 2.2 kW, ACS55

Motor control method - scalar

200/240 V, 1-phase supply, 3-phase output, 0.18 kW - 2.2 kW

100/120 V, 1-phase supply, 3-phase output, 0.18 kW - 0.37 kW

What is an ABB micro drive, ACS55?

The ABB micro drive meets the requirements of OEMs, machinery builders and panel builders. It is a component that is bought, together with other components, from a logistical distributor. The aim is for the ABB micro drive to be so small and simple that users of contactors and softstarters are encouraged to move to the benefits of variable-speed control. The ACS55 is a simple drive, programmed by switches. Extended programming is possible via a PC if required, as is programming without power.

For more details, please refer to Technical Catalogue 3AFE68899842

Where can it be used?

- Washing machines
- Mixers
- Boring machines
- Pizza ovens
- Vacuum cleaners
- Sliding doors
- Dryers
- Dishwashers
- Treadmills
- Car washing machines
- Rotating billboards
- Electric gates

Highlights

- Quick and easy installation - less than 5 minutes
- No programming - easy and descriptive interface
- Can be programmed via DriveConfig if needed to access extended functions (useful to OEMs)
- Compact size and narrow shape
- Ideal drive for DIN-rail mounting
- 110 V single phase – input gives 240 V, 3-phase output
- Two mounting orientations
- IP20 as standard
- No control panel required
- User interface via three rotary switches and a further eight on/off function DIP switches located on panel front
- Potentiometer option
- Integral EMC filter for 1st environment (EN61800-3), unrestricted distribution (C1)
- Optional first environment filter for extended cable runs
- Optimised switching frequency for low noise (up to 16 kHz)
- Silent motor

Main features

Feature	Advantage	Benefit
No programming if required	Inverter parameter settings with DIP switches and potentiometers. Extended programming is possible via DriveConfig if needed	Faster set-up Easier configuration Easy drive for new users
Compact size and narrow shape	Up to 0.37 kW, 45 mm width; 2.2 kW, 67.5 mm width	Less space required for installation
Removable mounting clip	Removable clip allows DIN-rail and wall-mounting from back and side of the unit	Flexible and easy mounting
DriveConfig kit	Fast and safe configuration of an unpowered drive	Simple programming for high volume OEMs - programming in the box, no mains power needed
EMC	First environment. C1 EMC filters as standard ('E' model)	Low EMC emissions
Automatic switching frequency	Increases switching frequency automatically when drive temperature is decreased	Provides lowest possible noise without derating the drive
110-240 V AC, single phase supplies	Output always capable of full 240 V, 3-phase, regardless of supply voltage	Can easily replace single phase cap start motors
RoHS compliance	Compliance achieved during 2007	Environmentally friendly drives

ABB micro drive

ACS55 – Ratings, types, voltages, prices and dimensions

200/240 V, 1-phase supply, 3-phase output

Nominal ratings				Frame	Fuse	Heat	Cooling	Type	List
Nominal kW	Input current A	Nom. output current A	Max output A		A Type gG	dissipation W	requirements m³/h		price
With EMC filter									
0.18	4.4	1.4	2.1	A	10	21	+Nat Vent	ACS55-01E-01A4-2	£93
0.37	6.9	2.2	3.3	A	16	32	+Nat Vent	ACS55-01E-02A2-2	£102
0.75	10.8	4.3	6.5	B	16	51	+Nat Vent	ACS55-01E-04A3-2	£122
1.5	18.2	7.6	11.4	D	25	74	26	ACS55-01E-07A6-2	£170
2.2	22	9.8	14.7	D	32	103	26	ACS55-01E-09A8-2	£199
Without EMC filter									
0.18	4.4	1.4	2.1	A	10	21	+Nat Vent	ACS55-01N-01A4-2	£88
0.37	6.9	2.2	3.3	A	16	32	+Nat Vent	ACS55-01N-02A2-2	£97
0.75	10.8	4.3	6.5	B	16	51	+Nat Vent	ACS55-01N-04A3-2	£114
1.5	18.2	7.6	11.4	C	25	74	26	ACS55-01N-07A6-2	£159
2.2	22	9.8	14.7	C	32	103	26	ACS55-01N-09A8-2	£186

+ Ensure minimum installation space is provided, see User's Manual for details

100/120 V, 1-phase supply, 3-phase output

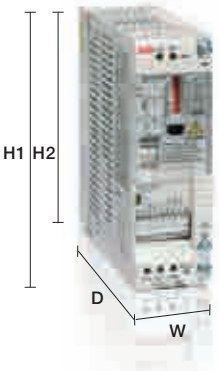
Nominal ratings				Frame	Fuse	Heat	Cooling	Type	List
Nominal kW	Input current A	Nom. output current A	Max output A		A Type gG	dissipation W	requirements m³/h		price
With EMC filter									
0.18	6.4	1.4	2.1	A	10	24	+Nat Vent	ACS55-01E-01A4-1	£101
0.37	9.5	2.2	3.3	A	16	35	+Nat Vent	ACS55-01E-02A2-1	£113
Without EMC filter									
0.18	6.4	1.4	2.1	A	10	24	+Nat Vent	ACS55-01N-01A4-1	£98
0.37	9.5	2.2	3.3	A	16	35	+Nat Vent	ACS55-01N-02A2-1	£106

+ Ensure minimum installation space is provided, see User's Manual for details

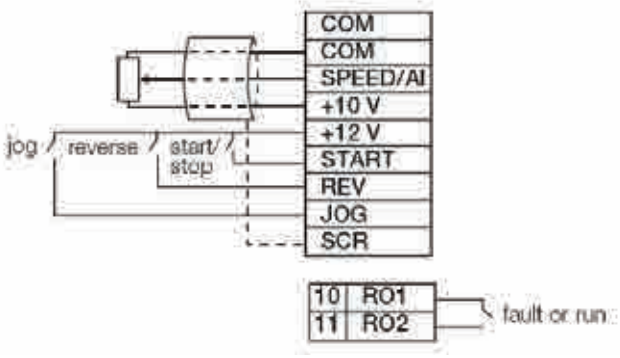
Dimensions and weights

Frame size	H1 mm	H2 mm	W mm	D mm	Weight Kg
A	170	146.5	45	128	0.65
B	170	146.5	67.5	128	0.70
C	194	171	70	159	1.1
D	226	203	70	159	1.1

H1 = Height with mounting clip
H2 = Height without mounting clip
W = Width
D = Depth



ACS55 typical I/O connections



Options and interfaces

Potentiometer

Potentiometer with two switches: start/stop and forward/reverse direction. No external power source is needed for the potentiometer, connects directly to drive I/O.

DriveConfig programming with no power

To increase the number of applications possible with the ACS55, the DriveConfig kit can be used to access an extended parameter set. It is still possible to programme in the usual way, if these extended features are not required. DriveConfig also allows programming in the box without power.

ABB micro drive

0.37 kW to 4 kW, ACS150

Motor control method - scalar

200/240 V, 1-phase supply, 0.37 kW - 2.2 kW

200/240 V, 3-phase supply, 0.37 kW - 2.2 kW

380/480 V, 3-phase supply, 0.37 kW - 4 kW

What is an ABB micro drive, ACS150?

The ABB micro drive meets the requirements of OEMs, machinery builders and panel builders. It is a component that is bought, together with other components, from a logistical distributor. ABB micro drives are designed to encourage users of contactors and softstarters to move to the benefits of variable-speed control. The ACS150 extends the capability of the ACS55 (see page 10), by adding an extended range of power frames and programmability. The ACS150 can solve more difficult tasks like PID functionality. To retain the simplicity of an ABB micro drive, the ACS150 does not have a serial communications interface or extended options but does have a fixed keypad and speed control potentiometer.

For more details, please refer to Technical Catalogue 3AFE68596114

Where can it be used?

ACS150 can be used to control less demanding components in any machine, fans or pumps or anywhere where a fixed speed motor needs to go to variable-speed control. The functionality of the drive is designed to compliment the ABB machinery drives and ABB motion control drives.

Highlights

– PID controller built-in
– DC hold stop ensures stationary motor shaft
– IR compensation improves starting torque for heavy loads
– Parameter lock prevents tampering by unauthorised staff
– DIN rail or screw mounting as standard
– IP20 enclosure
– Fixed basic control panel
– Dedicated control potentiometer
– Two-year warranty
– Flashdrop - parameter programming whilst still in its box - excellent for OEMs
– Protected against wiring errors: shows fault if power cable is inadvertently connected to motor terminals
– Automatic noise reduction
– Optional short or long parameter mode for standard or advanced users
– Unified height across the power range simplifies cabinet design
– Drive branding possible for large users

Main features

Feature	Advantage	Benefit
FlashDrop*	Faster and easier drive set-up and commissioning for volume manufacturing. Programming in the box	No need for high voltage safe programming areas Parameters can be hidden for clarity Programme the drive during machine production build-up
Fixed interface	Simple drive with comfortable and robust interface Easy to navigate parameter structure	Integrated control panel with clear LCD display, backlight and buttons for editing and control
Fixed potentiometer	Intuitive speed setting	Integrated potentiometer. Settings shown on the control panel
Programmable functions	Useful control functions like PID, accelerating rates and start/stop modes included	Take control of the motor and reduce cost in the installation
Built-in EMC filter	No need for external filtering	2nd environment built-in filter. Complying with IEC 61800-3 as standard
Built-in brake chopper	Reduced cost, saved space and simple wiring	100 percent braking capability
Flexible installation	Optimum layout and efficient cabinet space usage	Screw, DIN-rail, sideways and side-by-side mounting Unified height and depth
Drive protection	Latest solutions to protect the drive and offer trouble-free use and the highest quality	The drive protects itself when power is connected to the motor terminals. I/O protected against short-circuit. Coated boards included as standard
Brand labelling	Drive logo, control panel logo, manuals and box can be printed with machine builders logo and name	Drives and packaging badged to your design
RoHS compliance	Compliance achieved during 2007	Environmentally friendly drives

* For details of FlashDrop, see user interfaces in ABB machinery drive section (page 18)

ABB micro drive

ACS150 – Ratings, types, voltages and prices

200/240 V, 1-phase supply voltage

Nominal ratings			Frame	Fuse	Heat	Cooling	Type	List
Nominal kW	Nom. output current A	Max Output A		A Type gG	dissipation W	requirements m³/h		price
0.37	2.4	4.2	R0	10	25	+Nat Vent	ACS150-01E-02A4-2	£100
0.75	4.7	8.2	R1	16	46	24	ACS150-01E-04A7-2	£117
1.1	6.7	11.7	R1	20	71	24	ACS150-01E-06A7-2	£147
1.5	7.5	13.1	R2	25	73	21	ACS150-01E-07A5-2	£165
2.2	9.8	17.2	R2	35	96	21	ACS150-01E-09A8-2	£198

+ Ensure enough space around the unit - refer to the User's Manual for details

200/240 V, 3-phase supply voltage

3-phase, 240 V is also available for customers supplying the North American market. Please enquire for details.

380/480 V, 3-phase supply voltage

Nominal ratings			Frame	Fuse	Heat	Cooling	Type	List
Nominal kW	Nom. output current A	Max Output A		A Type gG	dissipation W	requirements m³/h		price
0.37	1.2	2.1	R0	10	11	+Nat Vent	ACS150-03E-01A2-4	£159
0.55	1.9	3.3	R0	10	16	+Nat Vent	ACS150-03E-01A9-4	£168
0.75	2.4	4.2	R1	10	21	13	ACS150-03E-02A4-4	£183
1.1	3.3	5.8	R1	10	31	13	ACS150-03E-03A3-4	£201
1.5	4.1	7.2	R1	16	40	13	ACS150-03E-04A1-4	£220
2.2	5.6	9.8	R1	16	61	19	ACS150-03E-05A6-4	£315
3	7.3	12.8	R1	16	74	24	ACS150-03E-07A3-4	£379
4	8.8	15.4	R1	20	94	24	ACS150-03E-08A8-4	£431

+ Ensure enough space around the unit - refer to the User's Manual for details

The drive can be fitted with the NEMA 1 kit for easy wall-mounting and convenient protection, see user interfaces in ABB machinery drive section, page 18.

ABB micro drive

ACS150 – Dimensions, I/O and options

Dimensions and weights
Cabinet-mounted drives (UL open), wall mounted drives (NEMA 1)

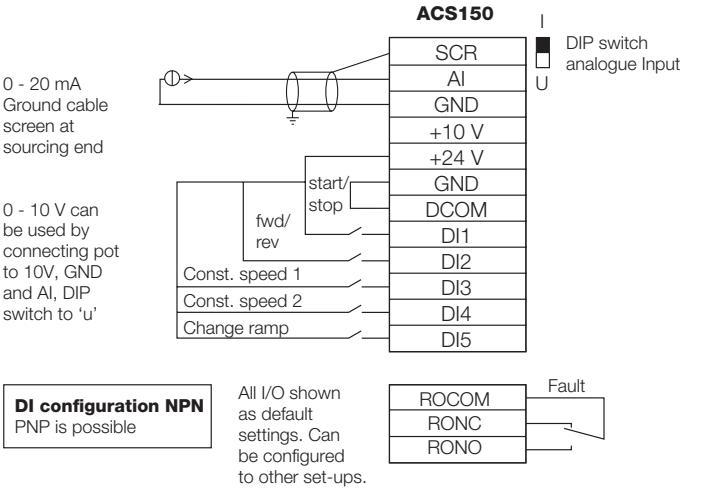
Frame size	IP20 UL open						NEMA 1				
	H1	H2	H3	W	D	Weight	H4	H5	W	D	Weight
	mm	mm	mm	mm	mm	Kg	mm	mm	mm	mm	Kg
R0	169	202	239	70	142	1.1	257	280	70	142	1.5
R1	169	202	239	70	142	1.3	257	280	70	142	1.5
R2	169	202	239	105	142	1.5	257	282	105	142	1.5

H1 = Height without fastenings and clamping plate
H2 = Height with fastenings but without clamping plate
H3 = Height with fastenings and clamping plate
H4 = Height with fastenings and NEMA 1 connection box
H5 = Height with fastenings, NEMA 1 connection box and hood
W = Width
D = Depth

Options available

– Input and output chokes
– Brake chopper resistors (all drives in the ACS150 range have integral chopper)
– 1st. environment EMC filters - footprint style
– Low leakage EMC filters < 30mA leakage
– FlashDrop - programming without power
– NEMA kit allows installations to be neater and provides mechanical support for glanded cables

ACS150 typical I/O connections



ACS150 user interfaces

The ACS150 has a simple user interface, consisting of I/O connections and a fixed programming keypad. An integrated speed control potentiometer is also provided.

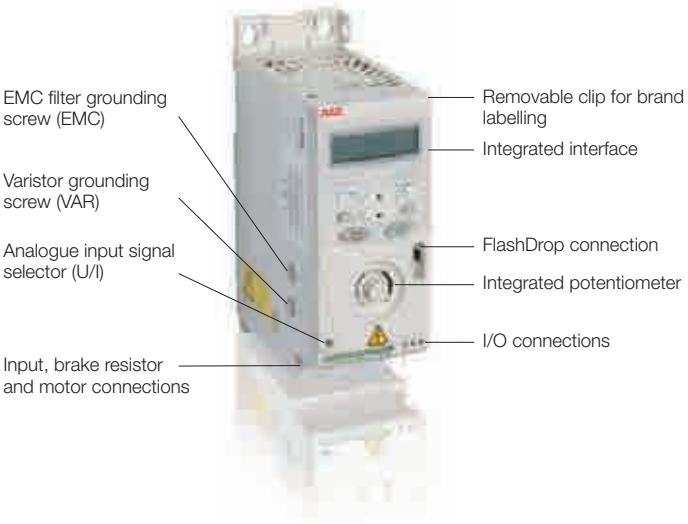


ABB machinery drive

0.37 kW to 22 kW, ACS355

Motor control method - scalar, vector (open and closed loop)

200/240 V, 1-phase supply, 0.37 kW - 2.2 kW

200/240 V, 3-phase supply, 0.37 kW - 11 kW

380/480 V, 3-phase supply, 0.37 kW - 22 kW

What is an ABB machinery drive?

ABB machinery drives are designed for the machine building sector. In serial type manufacturing the consumed time per unit is critical. The drive is designed to be optimal in terms of installation, setting parameters, available machinery features and commissioning. The basic product has been made as user-friendly as possible, yet providing high intelligence. The drive offers diverse functionality to cater for the most demanding needs. The drive is also equipped with a dual channel safe torque-off interface to SIL3/PL e.

Where can it be used?

ABB machinery drives are designed to meet the requirements of an extensive range of machinery applications. The drive is ideal for food and beverage, material handling, textile, printing, rubber and plastics and woodworking applications. The higher IP66 class variant meets all of the relevant hygiene requirements for the food and beverage industry.

The functionality of this ABB drive is designed to complement the ABB motion control drives and the ABB micro drives.

Highlights

– FlashDrop - parameter programming with drive still in its box - excellent for OEMs
– Sequence programming designed for food and beverage and materials handling applications - Eight-steps included

For more details, please refer to Technical Catalogue 3AFE68596106

– Impressive software and compact hardware
– Unified height and depth across the power range simplifies cabinet design
– Optimised interfaces for users and machines (can select Basic or Assistant control panel)
– Protected against wiring errors: shows fault if power cable is inadvertently connected to motor terminals
– Automatic noise reduction
– Drive branding possible for large users

Main features

Feature	Advantage	Benefit
FlashDrop*	Faster and easier drive set-up and commissioning for volume manufacturing. Programming with no power	Fast, safe and trouble-free method to set up and commission without powering up the drive - patented
Safe torque-off	Built-in compliance to new machinery directive	SIL3/PL e certified dual channel input - TÜV approved
Sequence programming	Application specific 8-state programming with comprehensive triggering conditions	Logic programming included as standard Reduces the need for external PLC
Common DC link	Connection to existing DC power sources (patented)	Easy integration into high performance machines
User interfaces	Wide range, including Assistant panel	Cost efficient approach - meets requirements of OEM
Fieldbus	Extensive range of industrial fieldbus option modules available	Connectability to all of the most popular fieldbuses
24 V 'live keypad' operation	Connect 24 V to the drive via the MPOW option	Keep fieldbus, control card and I/O healthy while able to remove the main supply - safer maintenance
Built-in EMC filter	2nd environment filter complying with IEC 61800-3 as standard	No extra space, parts, time or cost required
Built-in brake chopper	100 percent braking capability	Reduces cost, saves space and simplifies wiring
Drive protection	Latest solutions to protect the drive and offer trouble-free use and the highest quality	The drive protects itself when power is connected to the motor terminals. I/O protected against short-circuit Coated boards included as standard
IP66/69k enclosure option	Makes drive suitable for hose down applications	Meets food hygiene standards in a wall-mounted enclosure
Brand labelling	Drive logo, control panel logo, manuals and box can be printed with machine builders logo and name	Drives and packaging badged to your design
RoHS compliance	Compliance achieved during 2007	Environmentally friendly drives

* For details of FlashDrop, see user interfaces in ABB machinery drive section, page 18

ABB machinery drive

ACS355 - Ratings, types, voltages and prices

200/240 V, 1-phase supply voltage

Nominal ratings			Frame	Fuse	Heat	Cooling	Type	IP20 list	IP66 list
Nominal kW	Nom. output current A	Max Output A		A Type gG	dissipation W	requirements m^3/h	(code shown is IP20)	price without control panel*	price with control panel**
0.37	2.4	4.2	R0	10	48	+Nat Vent	ACS355-01E-02A4-2	£111	n/a
0.75	4.7	8.2	R1	16	72	24	ACS355-01E-04A7-2	£139	n/a
1.1	6.7	11.7	R1	20	97	24	ACS355-01E-06A7-2	£163	n/a
1.5	7.5	13.1	R2	25	101	21	ACS355-01E-07A5-2	£179	n/a
2.2	9.8	17.2	R2	35	124	21	ACS355-01E-09A8-2	£219	n/a

+ Ensure enough space around the unit - refer to the User's Manual for details
* Note: IP20 drives require a keypad for parameter alteration
** Note: IP66 drives are always delivered with the Assistant keypad

200/240 V, 3-phase supply voltage

3-phase, 240 V is also available for customers supplying the North American market. Please enquire for details.

380/480 V, 3-phase supply voltage

Nominal ratings			Frame	Fuse	Heat	Cooling	Type	IP20 list	IP66 list
Nominal kW	Nom. output current A	Max Output A		A Type gG	dissipation W	requirements m^3/h	(code shown is IP20 For IP66 add +B063)	price without control panel*	price with control panel**
0.37	1.2	2.1	R0	10	35	+Nat Vent	ACS355-03E-01A2-4	£189	£400
0.55	1.9	3.3	R0	10	40	+Nat Vent	ACS355-03E-01A9-4	£199	£402
0.75	2.4	4.2	R1	10	50	13	ACS355-03E-02A4-4	£218	£417
1.1	3.3	5.8	R1	10	60	13	ACS355-03E-03A3-4	£247	£463
1.5	4.1	7.2	R1	16	69	13	ACS355-03E-04A1-4	£300	£526
2.2	5.6	9.8	R1	16	90	19	ACS355-03E-05A6-4	£348	£600
3	7.3	12.8	R1	16	107	24	ACS355-03E-07A3-4	£454	£777
4	8.8	15.4	R1	20	127	24	ACS355-03E-08A8-4	£517	£882
5.5	12.5	21.9	R3	25	161	52	ACS355-03E-12A5-4	£599	£1,043
7.5	15.6	27.3	R3	30	204	52	ACS355-03E-15A6-4	£777	£1,237
11	23.1	40.4	R3	50	301	71	ACS355-03E-23A1-4	£949	n/a
15	31.0	54.3	R4	80	408	96	ACS355-03E-31A0-4	£1,216	n/a
18.5	38.0	66.5	R4	100	498	96	ACS355-03E-38A0-4	£1,443	n/a
22	44.0	77.0	R4	100	588	96	ACS355-03E-44A0-4	£1,764	n/a

+ Ensure enough space around the unit - refer to the User's Manual for details
* Note: IP20 drives require a keypad for parameter alteration
** Note: IP66 drives are always delivered with the Assistant keypad

Control panel for ACS355

Control panel	Type	Price
Assistant control panel	ACS-CP-A	£86†
Basic keypad	ACS-CP-C	£24

† Price of control panel only when purchased with drive

Panel mounting kit and user interface descriptions, see page 18

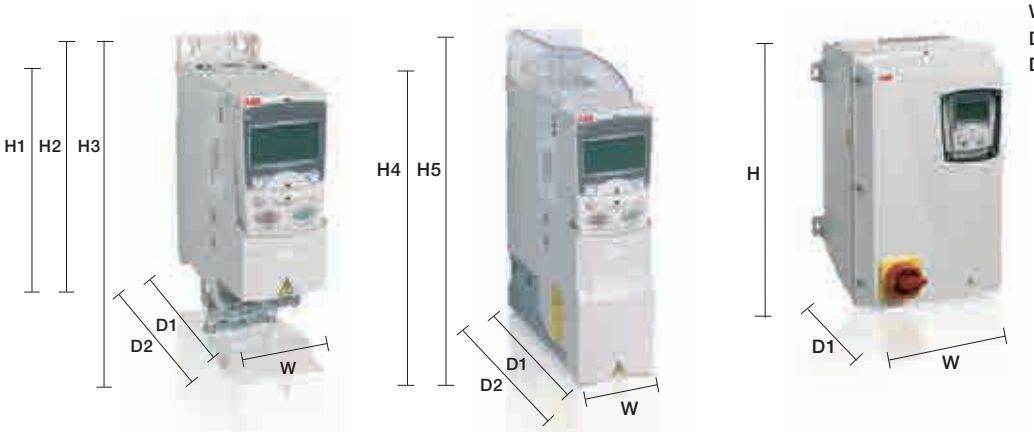
ABB machinery drive

ACS355 – Dimensions, I/O and options

Dimensions and weights

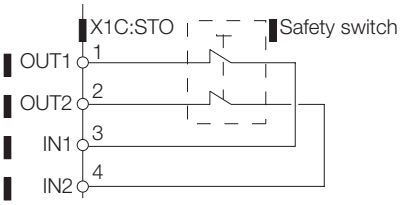
	IP20 UL Open							NEMA 1/UL Type 1						IP66/67/UL Type 4x			
Frame size	H1 mm	H2 mm	H3 mm	W mm	D1 mm	D2 mm	Weight Kg	H4 mm	H5 mm	W mm	D1 mm	D2 mm	Weight kg	H mm	W mm	D1 mm	Weight Kg
R0	169	202	239	70	161	187	1.2	257	280	70	169	187	1.6	-	-	-	
R1	169	202	239	70	161	187	1.2	257	280	70	169	187	1.6	305	195	281	7.7
R2	169	202	239	105	165	191	1.5	257	282	105	169	191	1.9	-	-	-	-
R3	169	202	236	169	169	195	2.5	260	299	169	177	195	3.1	436	246	277	13
R4	181	202	244	260	169	195	4.4	270	320	260	177	195	5.0	-	-	-	-

H = Height
H1= Height without fastenings and clamping plate
H2 = Height with fastenings but without clamping plate
H3 = Height with fastenings and clamping plate
H4 = Height with fastenings and NEMA 1 connection box
H5 = Height with fastenings, NEMA 1 connection box and hood
W = Width
D1 = Standard depth
D2 = Depth with MREL or MTAC option



STO connections

The ACS355 has a dual channel STO (safe torque-off) input as standard, certified to BS EN 62061 and BS EN 13849-1



Options available

- Input and output chokes
- Brake chopper resistors (all drives in the ACS355 range have integral chopper)
- 1st. environment EMC filters - footprint style
- Low leakage EMC filters < 30 mA leakage
- FlashDrop, programming in the box
- Fieldbus modules
- NEMA kit allows installations to be neater and provides mechanical support for glanded cables
- An extensive range of user interfaces is available - please see following pages
- IP66 pressure relief valves

Typical control connections

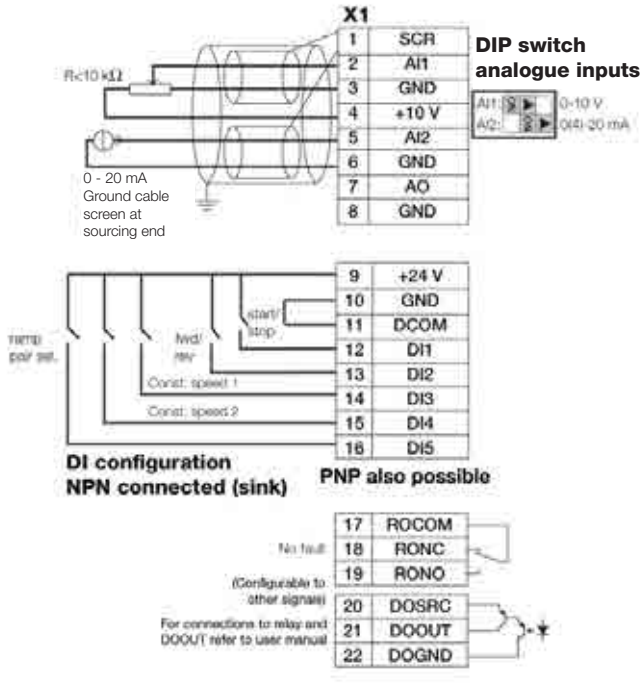


ABB machinery drive

ACS355 – User interfaces

Assistant control panel (+J400)

The Assistant control panel features a multilingual alphanumeric display for easy drive programming. The control panel has various assistants and a built-in help function to guide the user. It includes a real-time clock, which is used during fault logging and in controlling the drive, such as start/stop. The control panel can be used for copying parameters for backup or for downloading to another drive. A large graphical display and soft keys make it extremely easy to navigate. For further information, see ABB general purpose drive section on page 28.

Basic control panel (+J404)

The Basic control panel features a single line numeric display. The panel can be used to control the drive, set the parameter values or copy them from one drive to another, or view changes.

Panel cover

The panel cover protects the drive when no control panel is used. The ABB machinery drive is delivered with a panel cover as standard, thereby providing a cost effective package. In addition, there are two alternative control panels available as options, see above.

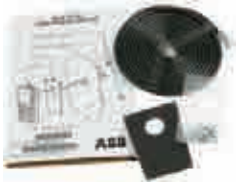
NEMA 1 kit

The NEMA 1 kit is a convenient cover which is added to the drive and enables easy wall-mounting. It includes a connection box for cable gland or conduit tube installation and a hood for protection against dirt and dust.

Panel mounting kit, IP54 and IP66

The panel mounting kits enable mounting of control panels onto cabinet doors. These kits include a 3 m extension cable, a gasket, mounting screws and a mounting template - two versions are now available, IP54 and IP66. The IP66 has an additional keypad membrane cover.

Note: IP66 cover is not suitable for outdoor use.



Relay extension module (+L511)

Add an additional three relays to the ACS355 to allow greater use of the drives programme. Fits behind the keypad.

Potentiometer (+J402)

Potentiometer with two switches: start/stop and forward/reverse direction. No external power source is needed for the potentiometer. Fits to the drive I/O.

FlashDrop

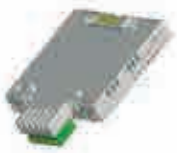
Programme the drive whilst still in the box, with no power. Perfect for OEMs and machine builders. FlashDrop is a powerful palm-sized tool for fast and easy parameter selecting and setting. It gives the possibility to hide selected parameters to protect the machine. The tool stores 20 parameter sets, which can be moved between a PC and a drive. Safe programming during machine building production for unskilled staff.

Fieldbus interfaces

Extensive range of plug-in fieldbus interfaces, allowing connection to Profibus, DeviceNet, CanOpen, Modbus RTU and Ethernet and many others.

24V “live kepad” options

There are two ways of powering the fieldbus modules, so that they operate when the main power is removed.



FEPA - maintains power to the fieldbus module only.

MPOW (+G406) - Powers the fieldbus module, the control card, the drive I/O and the drive keypad, generating the functionality commonly known as ‘live keypad’ operation.

DriveWindow Light PC tool

DriveWindow Light is a parameterisation and commissioning tool used to set-up and commission the drive. Monitoring and diagnostic facilities are included, as well as a local control panel. Wizards are included to guide the user through the most commonly performed tasks.

ABB general purpose drive for fans and pumps

0.37 kW to 22 kW, ACS310

Motor control method – Scalar

200/240 V, 1-phase supply, 0.37 kW - 2.2 kW

200/240 V, 3-phase supply, 0.37 kW - 11 kW

380/480 V, 3-phase supply, 0.37 kW - 22 kW

What is an ABB general purpose drive for fans and pumps?

ABB general purpose drives include a dedicated fan and pump controller designed for squared-torque applications such as booster pumps, submersible pumps, irrigation pumps and centrifugal fans.

The drive design includes a powerful set of features which benefit pump and fan applications including built-in PID controllers and PFC (pump and fan control). The drives also have pre-programmed protection functions such as pipe cleaning (anti-jam) and duty standby functionality, including soft pipe filling to reduce leaks.

These features, combined with pre-programmed application macros, an intuitive user interface, and several assistant screens, speed up the installation, parameter setting and commissioning of the drive.

Where can it be used?

The ABB general purpose drive's software features are ideal for solving the challenges and issues surrounding pumping in general, and those of water and wastewater in particular.

The drive is designed to compliment the features offered by the industry specific products for water and wastewater (see page 29).

For more details, please refer to Technical Catalogue 3AUA0000051082

Highlights

- Pump and soft pump and fan control (PFC and SPFC), for multi-pump and soft fill control
- Pipe cleaning (anti-jam) and pipe fill functions
- Multiple PID set points, allowing for automatic duty/assist/standby schemes to be implemented
- Energy efficiency counters, real-time clock
- Energy optimiser – optimises the motor control for the application to run with minimum energy requirements
- Load analyser for optimised dimensioning of the drive, motor and process
- Embedded Modbus RS-485 fieldbus interface
- FlashDrop tool for fast parameter setting, without mains power

Main features

Feature	Advantage	Benefit
Pump and fan control (PFC) feature to control pumps and fans in parallel	One drive controls several pumps or fans and eliminates the need for an external programmable logic controller Interlock function enables one motor to be disengaged from the mains supply while others continue operating in parallel	Saves cost of additional drives and external PLC Longer life for pump or fan system while reducing maintenance time and costs. Maintenance can be carried out safely without stopping the process
Soft pump and fan control feature (SPFC)	Reduces unwanted pressure peaks in pumps and pipelines when an auxiliary motor is started	Reduces maintenance costs and leaks typically seen in DOL starting. Longer life for pump or fan system
Pump protection functions	Pre-programmed features like: Pipe cleaning (anti-jamming), inlet/outlet pressure supervision and detection of under or overload for preventive maintenance	Reduces maintenance costs Smoother processes: improved and optimised system Longer life for pump and fan system, reduced maintenance costs
Energy monitoring and optimising features	Drive monitors the saved energy compared to equivalent DOL operation Drive controls the motor voltage dependant on the load	Energy savings presented in local currency and CO_2 Consumed energy optimised across the speed and load range
Full output current at 50°C ambient	Drive can be operated in ambient temperatures up to 50°C without de-rating the output current	Optimised drive dimensioning for wide temperature range
Unified height and depth	Optimum installation layout, as all drive frames are the same height – only the width changes	Space savings. Easier to lay the cabinet back panel out
Best-in-class user interfaces	Assistant and Basic keypads with intuitive operation. Short and long menus, Assistants and wizards for ease of use	Users are supported as they program the drive, can tailor the open menu views to suite there customer needs
FlashDrop*	Faster and easier drive set up and commissioning for volume manufacturing	Fast, safe and trouble-free method to set up and commission without powering up the drive - patented
RoHS compliance	Compliance achieved during 2007	Environmentally friendly drives

* For details of FlashDrop, see user interfaces (page 22)

ABB general purpose drive for fans and pumps

ACS310 – Ratings, types, voltages and prices

200/240 V, 1-phase supply voltage

Nominal ratings		Max	Frame	Fuse	Heat	Cooling	Type	IP20 list price
Nominal	Nom. output current	Output		A	dissipation	requirements		without control
kW	A	A		Type gG	W	m³/h		panel*
0.37	2.4	4.0	R0	10	48	+Nat Vent	ACS310-01E-02A4-2	£110
0.75	4.7	7.9	R1	16	72	24	ACS310-01E-04A7-2	£125
1.1	6.7	11.4	R1	20	97	24	ACS310-01E-06A7-2	£146
1.5	7.5	12.6	R2	25	101	21	ACS310-01E-07A5-2	£162
2.2	9.8	16.5	R2	35	124	21	ACS310-01E-09A8-2	£197

+ Ensure enough space around the unit - refer to the User's Manual for details
* Drives require a control panel for parameter alteration
For 50°C ratings contact ABB

200/240 V, 3-phase supply voltage

3-phase 240 V is also available for customers supplying the North American market. Please enquire for details.

380/480 V, 3-phase supply voltage

Nominal ratings		Max	Frame	Fuse	Heat	Cooling	Type	IP20 list price
Nominal	Nom. output current	Output		A	dissipation	requirements		without control
kW	A	A		Type gG	W	m³/h		panel*
0.37	1.3	2.1	R0	10	35	+Nat Vent	ACS310-03E-01A3-4	£171
0.55	2.1	3.3	R0	10	40	+Nat Vent	ACS310-03E-02A1-4	£180
0.75	2.6	4.2	R1	10	50	13	ACS310-03E-02A6-4	£197
1.1	3.6	5.8	R1	10	60	13	ACS310-03E-03A6-4	£219
1.5	4.5	7.2	R1	15	69	13	ACS310-03E-04A5-4	£285
2.2	6.2	9.8	R1	15	90	19	ACS310-03E-06A2-4	£315
3	8	12.8	R1	20	107	24	ACS310-03E-08A0-4	£404
4	9.7	15.4	R1	25	127	24	ACS310-03E-09A7-4	£459
5.5	13.8	21.9	R3	30	161	52	ACS310-03E-13A8-4	£533
7.5	17.2	27.3	R3	35	204	52	ACS310-03E-17A2-4	£702
11	25.4	40.4	R3	50	301	71	ACS310-03E-25A4-4	£857
15	34.1	54.3	R4	80	408	96	ACS310-03E-34A1-4	£1,101
18.5	41.8	66.5	R4	100	498	96	ACS310-03E-41A8-4	£1,284
22	48.4	77.0	R4	100	588	96	ACS310-03E-48A4-4	£1,569

+ Ensure enough space around the unit - refer to the User's Manual for details
* Drives require a control panel for parameter alteration
For 50°C ratings contact ABB

Control panel for ACS310

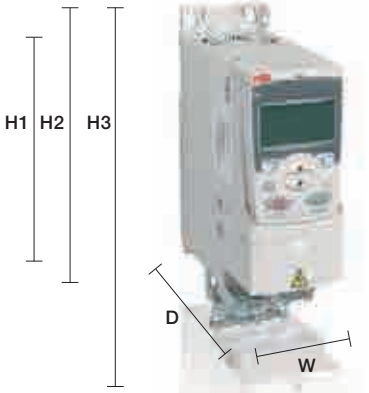
Control panel	Type	Price
Assistant control panel	ACS-CP-A	£86**
Basic keypad	ACS-CP-C	£24

** Price of control panel only when purchased with drive
Panel mounting kit and user interface descriptions, see page 22

ABB general purpose drive for fans and pumps

ACS310 – Dimensions, I/O and options

Dimensions and weights



Cabinet-mounted drives (IP20 UL open)

Wall-mounted drives (NEMA 1)

	IP20 UL Open						NEMA 1/UL Type 1				
Frame size	H1 mm	H2 mm	H3 mm	W mm	D mm	Weight Kg	H4 mm	H5 mm	W mm	D mm	Weight kg
R0	169	202	239	70	161	1.1	257	280	70	169	1.5
R1	169	202	239	70	161	1.3	257	280	70	169	1.7
R2	169	202	239	105	165	1.5	257	282	105	169	169
R3	169	202	236	169	169	2.9	260	299	169	177	3.5
R4	181	202	244	260	169	4.4	270	320	260	177	5.0

H1 = Height without fastenings and clamping plate
H2 = Height with fastenings but without clamping plate
H3 = Height with fastenings and clamping plate
H4 = Height with fastenings and NEMA 1 connection box
H5 = Height with fastenings, NEMA 1 connection box and hood
W = Width
D = Depth

Options available

– Input and output chokes
– ACS310 has no braking options
– 1st environment EMC filters - footprint style
– Low leakage EMC filters < 30mA leakage
– FlashDrop
– NEMA kit allows installations to be neater and provides mechanical support for glanded cables
– An extensive range of user interfaces is available - please see following pages

Typical control connections

– All I/O are programmable for other configurations

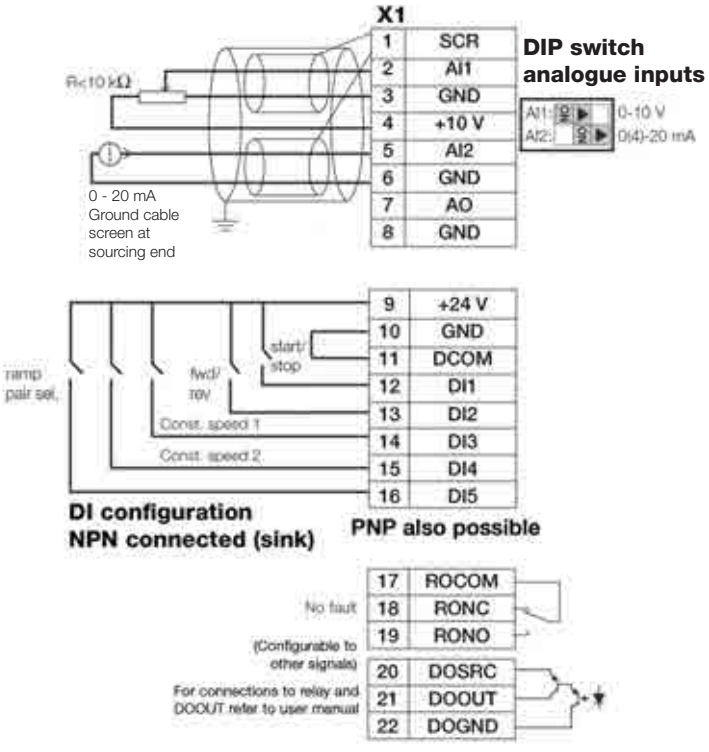


ABB general purpose drive for fans and pumps

ACS310 – User interfaces

Assistant control panel (+J400)

The Assistant control panel features a multilingual alphanumeric display for easy drive programming. The control panel has various assistants and a built-in help function to guide the user. It includes a real time clock, which is used during fault logging and in controlling the drive, such as start/stop. The control panel can be used for copying parameters for backup or for downloading to another drive. A large graphical display and softkeys make it extremely easy to navigate. For further information, see ABB general purpose drive section on page 28.

Basic control panel (+J404)

The Basic control panel features a single line numeric display. The panel can be used to control the drive, set the parameter values or copy them from one drive to another.

Panel cover

The panel cover protects the drive's connection when no control panel is used. The ABB general purpose drive is delivered with a panel cover as standard, thereby providing a cost effective package. In addition, there are two alternative control panels available as options, see above.

NEMA 1 kit

The NEMA 1 kit is a convenient cover which is added to the drive and enables easy wall-mounting. It includes a connection box for cable gland or conduit tube installation and a hood for protection against dirt and dust.

Panel mounting kit, IP54 and IP66

The panel mounting kit enables mounting of control panels on cabinet doors. These kits include a 3 m extension cable, a gasket, mounting screws and a mounting template - two versions are now available, IP54 and IP66. The IP66 has an additional keypad membrane cover.

Note: IP66 cover is not suitable for outdoor use.

Relay extension module (+L511)

Add an additional three relays to the ACS310 to allow greater use of the PFC program. Fits behind the keypad.

FlashDrop

Programme the drive whilst still in the box, with no power. Perfect for OEMs and machine builders. FlashDrop is a powerful palm sized tool for fast and easy parameter selecting and setting. It gives the possibility to hide selected parameters to protect the machine. The tool stores 20 parameter sets, which can be moved between a PC and a drive. Safe programming during machine building production for unskilled staff.

Fieldbus communications

ACS310 has no industrial fieldbus interfaces, but it does have an RS485 Modbus communications link built-in. This link can be used to communicate to industrial HMIs or remote monitoring devices or to a fieldbus via a suitable gateway.

DriveWindow Light PC tool

DriveWindow Light is a parameterisation and commissioning tool used to set-up and commission the drive. Monitoring and diagnostic facilities are included, as well as a local control panel. Wizards are included to guide the user through the most commonly performed tasks.

ABB general purpose drive

0.75 kW to 355 kW, ACS550

Motor control method - Scalar, vector speed and torque (open and closed loop)

208/240 V, 3-phase supply, 0.75 kW - 75 kW

380/480 V, 3-phase supply, 0.75 kW - 355 kW

What is an ABB general purpose drive?

The ABB general purpose drive is simple to buy, install, configure and use, saving considerable time. It is widely available through ABB's distributors. The drive has a common user and process interface, common software tools for sizing, commissioning and maintenance and common spare parts. A wide range of fieldbus options gives excellent connectivity and new energy monitoring allows energy management. IP21 and IP54 variants mean it can be installed in almost any environment.

Where can it be used?

The ABB general purpose drive can be used in a wide range of industries. Typical applications are many and varied. The vector motor control means the drive can be used to fulfil the needs of reasonably demanding applications of all kinds. For highly demanding torque applications, the ABB industrial drive with DTC should be chosen. The ABB general purpose drive is ideal in those situations where there is a need for simplicity to install, commission and use and where reasonable amounts of flexibility and functionality are required.

Highlights

– Easy ordering
– Quick installation
– Rapid start-up
– Trouble-free use

For more details, please refer to Technical Catalogue 3AFE64792857

– Easy interfacing
– Wide power range in wall-mounted IP21 and IP54 variants
– Assistant control panel for intuitive use
– Patent pending swinging choke for superior harmonic reduction, even at reduced motor load
– Sensorless vector and scalar control
– Integral EMC filter for 1st and 2nd environment as standard
– Flexible fieldbus system with built-in Modbus and numerous internally mountable fieldbus adapters
– New energy monitoring features record energy, CO_2 and money saved (compared to equivalent DOL)

Main features

Feature	Advantage	Benefit
FlashDrop*	Faster and easier drive set up and commissioning for volume manufacturing. Programming with no power.	Fast, safe and trouble-free method of programming available without powering up the drive - patented
Application macros	Ready-made macros for common applications	Fast single parameter set-up
Assistant control panel	Two softkeys, function of which changes according to the state of the panel. Built-in "Help" button, giving programming hints. Real-time clock, allows timed tracing of faults and setting of parameters to activate functions at various times of day. Changed parameters menu also included	Easy commissioning - Start-up assistant User friendly maintenance - Maintenance assistant Rapid fault diagnosis - Diagnostic assistant Quick access to all parameter changes - separate list
Clone drives	Copy parameters from drives of differing rating or software versions	Easy to copy parameters to other drives, reducing commissioning times
Programmable customer load curve	8-point load curve set during commissioning, with under and overload regions, as well as alarm conditions	Allows precise monitoring of changes in plant conditions and early warning of potential problems
Brake chopper	Built-in up to 11 kW	Reduced cost
Swinging chokes	Swinging DC chokes - matches the right inductance to the right load, thereby suppressing and reducing harmonics	Reduces total harmonic distortion (THD) emissions up to 25 percent, even at reduced load
EMC	1st and 2nd environment RFI filters as standard	No need for additional external filtering
Fieldbus	Built-in Modbus using RS 485 Optional plug-in fieldbus modules	Reduced cost, full access to industrial networks
Sensorless vector control	Improved motor control performance	Enables wider range of applications to be tackled
Low peak volts and du/dt	Motor peak voltage and rate of rise meets IEC 60034-17	Kind to motor windings
RoHS compliance	Compliance achieved during 2007	Environmentally friendly drives

* For details of FlashDrop, see user interfaces (page 28)

ABB general purpose drive

ACS550 – Variants, ratings, types, voltages and prices

ABB general purpose drive variants

Wall-mounted - 0.75 kW - 160 kW, 380/480 V

– Wall-mounted, frame sizes R1-R6
– IP21 as standard, IP54 as option
– 55 percent size reduction at 160 kW
– Built-in EMC filter
– Standard software, easy to configure
– Built-in Modbus interface
– Cable connection box
– Brake chopper in frame sizes R1-R2
– Assistant control panel
– Built-in patented swinging choke
– Sensorless vector control, scalar control
– FlashDrop compatible
– RoHS compliant

Free-standing - 160 kW - 355 kW, 380/480 V

– Free-standing, frame size R8
– IP21 as standard, very compact design
– Built-in EMC filter
– Standard software, easy to configure
– Built-in Modbus interface
– Pedestal unit on wheels, easy handling
– Assistant control panel
– Sensorless vector control, scalar control
– Free-standing units are not FlashDrop compatible
– Not RoHs compliant
– For dimensions and prices, please contact ABB

380/480 V, 3-phase supply voltage

†Ratings Normal use P_N kW	I_{2N} A	Frame A	Fuse A Type gG	Heat dissipation W	Cooling requirements m^3/h	Type (code shown is IP21, for IP54 add +B055)	IP21 list price without control panel*	IP54 list price without control panel*
1.1	3.3	R1	10	40	44	ACS550-01-03A3-4	£433	£513
1.5	4.1	R1	10	52	44	ACS550-01-04A1-4	£545	£603
2.2	5.4	R1	10	73	44	ACS550-01-05A4-4	£569	£635
3	6.9	R1	10	97	44	ACS550-01-06A9-4	£625	£681
4	8.8	R1	10	127	44	ACS550-01-08A8-4	£702	£793
5.5	11.9	R1	16	172	44	ACS550-01-012A-4	£850	£905
7.5	15.4	R2	16	232	88	ACS550-01-015A-4	£985	£1,063
11	23	R2	25	337	88	ACS550-01-023A-4	£1,198	£1,266
15	31	R3	35	457	134	ACS550-01-031A-4	£1,536	£1,671
18.5	38	R3	50	562	134	ACS550-01-038A-4	£1,997	£2,143
22	45	R3	50	667	134	ACS550-01-045A-4	£2,336	£2,448
30	59	R4	63	907	280	ACS550-01-059A-4	£2,841	£3,055
37	72	R4	80	1120	280	ACS550-01-072A-4	£3,291	£3,494
45	87	R4	125	1440	280	ACS550-01-087A-4	£4,068	£4,349
55	125	R5	160	1940	350	ACS550-01-125A-4	£4,810	£5,143
75	157	R6	200	2310	405	ACS550-01-157A-4	£5,171	£5,503
90	180	R6	250	2810	405	ACS550-01-180A-4	£6,579	£7,122
110	205	R6	250	3050	405	ACS550-01-195A-4	£7,940	£8,484
132	245	R6a**	315	3260	405	ACS550-01-246A-4	£9,752	£10,295
160	290	R6a**	315	3850	405	ACS550-01-290A-4	£11,523	£12,066

Includes EMC Filter

* Control panel is required for programming and set-up - see below

† Heavy duty ratings available, when higher overload requirements are needed - contact ABB

** R6a is not an official frame size, it just designates slightly different dimensions

208/240 V, 3-phase supply voltage

3-phase 240 V is also available for customers supplying the North American market. Please enquire for details.

Control panel for ACS550

Control panel	Type	Price
Assistant control panel	ACS-CP-A	£86**

** Price of control panel only when purchased with drive

ABB drive for HVAC

0.75 kW to 355 kW, ACH550

Motor control method - Scalar, vector speed and torque (open and closed loop)

208/240 V, 3-phase supply, 0.75 kW - 75 kW

380/480 V, 3-phase supply, 0.75 kW - 355 kW

What is an ABB HVAC drive?

The ABB HVAC drive, ACH550, is a complete dedicated low voltage AC drive especially for heating, ventilation & air-conditioning (HVAC) applications. The drives are designed to meet the HVAC market requirements including harmonics and EMC standards and for easy integration with building management systems straight out of the box. They feature built-in control programmes specifically designed for HVAC applications like cooling tower fans, supply and return fans, and booster pumps and condensers. With built-in PID control, native BACnet communication, timers, real-time clock and a calendar, ABB drives provide flexible solutions for a wide range of HVAC needs.

For more details, please refer to Technical Catalogue 3AFE68295378

Where can it be used?

ABB HVAC drives make maintaining a buildings comfort zone easy, quick and energy efficient. The drives control the speed of pump, fan and compressor motors used in air handling units, cooling towers, chillers and other HVAC applications. They help reduce the HVAC system's energy consumption by up to 70 percent, and quite often have payback times of less than a year. With more than 500,000 drives for HVAC installed globally, these highly reliable drives with built-in BACnet easily integrate into building management systems. The drives are stocked globally for quick delivery.

Highlights

- Easy ordering
- Quick installation
- Rapid start-up, trouble-free use, easy interfacing
- Built in BACnet
- Wide power range in wall-mounted IP21 and IP54 variants
- Programmed with several HVAC applications, including supply and return fans, cooling tower fans, booster pumps and condensers.
- Intelligent HVAC control panel with clear text
- New energy monitoring features record energy, CO_2 and money saved (compared to equivalent DOL)

Main features

Feature	Advantage	Benefit
Swinging choke	Patented by ABB Reduces the drives' harmonic signature	Reduces part load harmonics by up to 25 percent, in comparison with traditional chokes. Variable air volume (VAV) systems run on partial loads at least 95 percent of the time
EMC (manufacturer's statement available)	Integrated category C2 (1st environment) filters to BS EN 61800-3	EMC filters suitable for 400 V network connection built into the drive as standard will save panel space, avoid additional wiring, earthing and assembly costs
Additional serial communications	HVAC protocols built in as standard. BACnet, Modbus RTU, FLN Apogee, N2 Metasys, RS 485 Fieldbus adapter allows connection of: LonWorks, Profibus-DP, CANopen, DeviceNet, Modbus/TCP, ControlNet, Ethernet	Can connect to any building management system (BMS)
Real-time clock	Easily set up at time of installation and protected by its own battery back-up	Can be used together with timer functions of the drive to trigger various events (via relays or outputs) within the application software such as time / speed profile, allowing the drive to be a stand-alone unit without the need for BMS input.
System diagnostics	Diagnostic assistant, on board fault history with real time of when fault occurred, covering voltage, current, DC link level etc	Instant fault tracking and date stamping, gives status of drive to enable rapid drive diagnostics
Energy efficiency counters	Works out energy savings of the application in kWh and MWh; the cost of the energy saved in a local currency; and the carbon dioxide (CO_2) emissions equivalent of the energy saved	Can assist with electricity billing in accordance with Part L2 Building Regulations. Allows verification of energy savings before making investments in capital equipment

* For details of FlashDrop, see user interfaces (page 28)

ABB drive for HVAC

ACH550 – Variants, ratings, types, voltages and prices

ABB HVAC drive variants

Wall-mounted - 0.75 kW - 160 kW, 380/480 V,

– Wall-mounted, frame sizes R1-R6
– 2 variants, IP21 and IP54
– 55 percent size reduction at 160 kW
– Built-in EMC filter (1st & 2nd environment)
– Standard software, easy to configure
– Built-in BACnet and Modbus interfaces
– Cable connection box
– Brake chopper in frame sizes R1-R2
– HVAC assistant control panel
– Built-in patented swinging choke
– Sensorless vector control, scalar control
– FlashDrop compatible
– RoHS compliant

Free-standing - 160 - 355 kW, 380/480 V

– Free-standing, frame size R8
– IP21 as standard, very compact design
– Built-in EMC filter
– Standard software, easy to configure
– Built-in BACnet and Modbus interface
– Pedestal unit on wheels, easy handling
– HVAC assistant control panel
– Sensorless vector control, scalar control
– Free-standing units are not FlashDrop compatible
– Not RoHs compliant
– For dimensions and prices, please contact ABB

Types, ratings and dimensions
380-480 V, 3-phase supply voltage

†Ratings Normal use P_N kW	I_{2N} A	Frame A	Fuse A Type gG	Heat dissipation W	Cooling requirements m^3/h	Type (code shown is IP21, for IP54 add +B055)	IP21 list price without control panel*	IP54 list price without control panel*
0.75	2.4	R1	10	30	44	ACH550-01-02A4-4		
1.1	3.3	R1	10	40	44	ACH550-01-03A3-4		
1.5	4.1	R1	10	52	44	ACH550-01-04A1-4	For prices on industry specific products please contact ABB's HVAC team	For prices on industry specific products please contact ABB's HVAC team
2.2	5.4	R1	10	73	44	ACH550-01-05A4-4		
3	6.9	R1	10	97	44	ACH550-01-06A9-4		
4	8.8	R1	10	127	44	ACH550-01-08A8-4		
5.5	11.9	R1	16	172	44	ACH550-01-012A-4		
7.5	15.4	R2	16	232	88	ACH550-01-015A-4		
11	23	R2	25	337	88	ACH550-01-023A-4		
15	31	R3	35	457	134	ACH550-01-031A-4		
18.5	38	R3	50	562	134	ACH550-01-038A-4		
22	45	R3	50	667	134	ACH550-01-045A-4		
30	59	R4	63	907	280	ACH550-01-059A-4		
37	72	R4	80	1120	280	ACH550-01-072A-4		
45	87	R4	125	1440	280	ACH550-01-087A-4		
55	125	R5	160	1940	350	ACH550-01-125A-4		
75	157	R6	200	2310	405	ACH550-01-157A-4		
90	180	R6	250	2810	405	ACH550-01-180A-4		
110	205	R6	250	3050	405	ACH550-01-195A-4		
132	245	R6a**	315	3260	405	ACH550-01-246A-4		
160	290	R6a**	315	3850	405	ACH550-01-290A-4		

Includes EMC Filter

* Control panel is required for programming and set-up - see below

† Heavy duty ratings available, when higher overload requirements are needed - contact ABB

** R6a is not an official frame size, it just designates slightly different dimensions

208/240 V, 3-phase supply voltage

3-phase 240 V is also available for customers supplying the North American market. Please enquire for details.

Control panel for ACS550

Control panel	Type	Price
Assistant control panel	ACS-CP-A	£POA

ABB general purpose drive and ABB HVAC drive

ACS550 and ACH550 – Dimensions, I/O and options

Dimensions and weights

Frame size	IP21 / UL open					IP54 / UL type 12			
	H1	H2	W	D	Weight	H	W	D	Weight
	mm	mm	mm	mm	Kg	mm	mm	mm	Kg
R1	369	330	125	212	6.5	449	213	234	8.2
R2	469	430	125	222	9	549	213	245	11.2
R3	583	490	203	231	16	611	257	253	18.5
R4	689	596	203	262	24	742	257	284	26.5
R5	739	602	265	286	34	776	369	309	38.5
R6	880	700	300	400	69	924	410	423	80
R6a	986	700	302	400	73	1119	410	423	84

** R6a not an official frame size, shown here to highlight the slightly different dimensions of the largest rating

H1 = Height with cable connection box
H2 = Height without cable connection box
W = Width
D = Depth

Brake units and choppers technical data

Frequency converter input voltage	Resistor ohm	Continuous output W	Max. output 20 s W	Brake unit type code
200 - 240 V AC	32	2000	4500	ACS-BRK-C
380 - 480 V AC	32	2000	12000	ACS-BRK-C
200 - 240 V AC	10.5	7000	14000	ACS-BRK-D
380 - 480 V AC	10.5	7000	42000	ACS-BRK-D

Chopper dimensions

Width (W) mm	Height (H) mm	Depth (D) mm	Weight kg	Brake unit type code
150	500	347	7.5	ACS-BRK-C
270	600	450	20.5	ACS-BRK-D

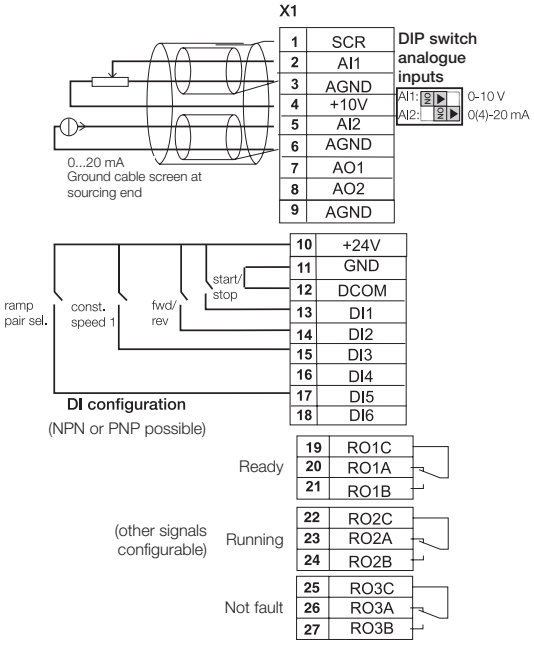
Other available options ACS550 and ACH550

– IP54 protection class (frames R1-R6a)
– Encoder feedback option available
– For other options, please see the user interfaces on page 28

Typical control connections ACS550 and ACH550

These connections are shown as examples only. Please refer to the User's Manual – macro section, for more detailed information and for different I/O configurations.

Typical I/O connections ACS550



Typical I/O connections ACH550

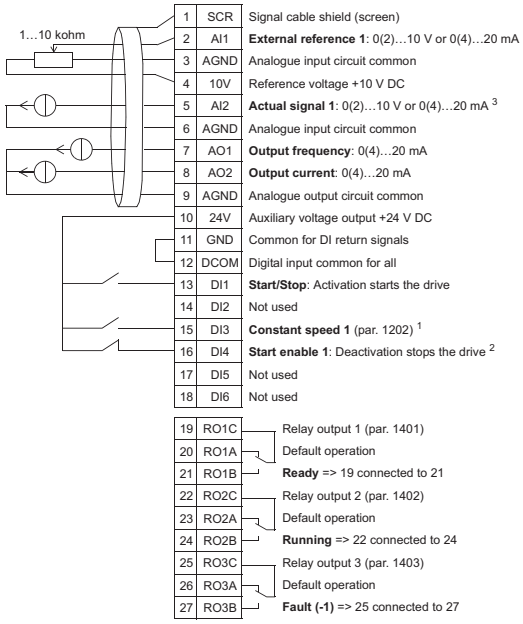

1...10 kohm
1 SCR Signal cable shield (screen)
2 AI1 External reference 1: 0(2)…10 V or 0(4)…20 mA
3 AGND Analogue input circuit common
4 10V Reference voltage +10 V DC
5 AI2 Actual signal 1: 0(2)…10 V or 0(4)…20 mA 3
6 AGND Analogue input circuit common
7 AO1 Output frequency: 0(4)...20 mA
8 AO2 Output current: 0(4)…20 mA
9 AGND Analogue output circuit common
10 24V Auxiliary voltage output +24 V DC
11 GND Common for DI return signals
12 DCOM Digital input common for all
13 DI1 Start/Stop: Activation starts the drive
14 DI2 Not used
15 DI3 Constant speed 1 (par. 1202) 1
16 DI4 Start enable 1: Deactivation stops the drive 2
17 DI5 Not used
18 DI6 Not used
19 RO1C Relay output 1 (par. 1401)
20 RO1A Default operation
21 RO1B Ready => 19 connected to 21
22 RO2C Relay output 2 (par. 1402)
23 RO2A Default operation
24 RO2B Running => 22 connected to 24
25 RO3C Relay output 3 (par. 1403)
26 RO3A Default operation
27 RO3B Fault (-1) => 25 connected to 27

ABB general purpose drive and ABB HVAC drive

ACS550 and ACH550 – User interfaces

Assistant control panel

For easy drive programming, a detachable, multilingual alphanumeric Assistant control panel is offered as standard. The control panel has various assistants and a built-in help function to guide the user. It includes a real time clock, which can be used during fault logging and in controlling the drive, such as start/stop at certain times of the day. The control panel can be used for copying parameters for back-up or for downloading to another drive. A large graphical display and soft-keys make it extremely easy to navigate.

ACS550 keypad

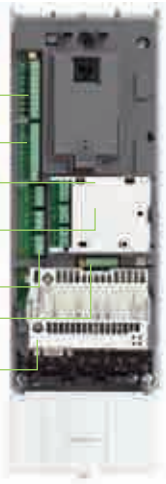
- Local/Remote indication
- Motor rotation indicator
- Speed reference
- Actual value 1, Speed (selectable)
- Actual value 2, Output current (selectable)
- Actual value 3, Process value (selectable)
- Softkey 2 function
- Real time clock
- Softkey 1 function

	ACS550	ACH550	Function
	Start	Hand	Initiates operation of motor control
	Stop	Off	Ceases operation of motor control
	Up	Up	Changes parameters and their value/ increases reference
	Down	Down	Changes parameters and their value/ decreases reference
	Loc/Rem	Auto	Changes drive state from local/hand control (control panel) to remote/auto control (I/O or other external source)
	HELP		Built-in “Help” button
	Softkey 1		Function changes according to state of panel
	Softkey 2		Function changes according to state of panel

ACH550 keypad

- Hand/Auto indication
- Motor rotation indicator
- Example of a parameter name
- Example of a parameter selection
- Softkey 2 function
- Real time clock
- Softkey 1 function

Overview of ACS550 and ACH550 interfaces



Relay extension (+L511)

An extra 3 V free change-over relays can be added to the ACx550 by requesting an OREL module.

Panel mounting kit, IP54 and IP66

The panel mounting kit enables mounting of control panels on cabinet doors. These kits include a 3 m extension cable, a gasket, mounting screws and a mounting template - two versions are now available, IP54 and IP66. The IP66 has an additional keypad membrane cover.

FlashDrop

A powerful palm-sized tool for fast and easy parameter setting, ideal for programming many drives. Programming in the box - unpowered. Ideal for OEMs as programming can be left until the moment before commissioning, or at the end of the production line, making it a safe option.

Fieldbus modules and fieldbus

An extensive range of fieldbus modules are available to allow connection to all the major industrial protocols. The drive has an RS485 Modbus interface built-in.

DriveWindow Light PC tool

DriveWindow Light is a parameterisation and commissioning tool used to set-up and commission the drive. Monitoring and diagnostic facilities are included, as well as a local control panel. Wizards are included to guide the user through the most commonly performed tasks.

ABB drive for water and wastewater

0.37 kW to 500 kW, ACQ810
Motor control method – DTC
200/480 V, 3-phase supply, 0.37 kW - 500 kW

What is an ABB drive for water and wastewater?

The ABB industry-specific drive is designed for all of the applications commonly used in the water and wastewater industry. The specifically designed modules feature tailor-made pump control functions for single and multi-pump systems. These functions ensure smooth, disturbance-free operation of water and wastewater processes, maximising energy efficiency while reducing unnecessary downtime. The drives' pump-specific functions decrease the lifecycle cost of the pumping system, helping to save time and money. The power range has now been expanded with the introduction of the G1 and G2 frame sizes.

For further information, see Technical Catalogue 3AUA0000055685

Where can it be used?

The ABB industry-specific drive module can be used for most of the variable-speed applications contained within the water and wastewater industry, to optimise the system and to save energy. The modules are designed for cabinet assembly and are easily mounted side-by-side. Intelligent start-up assistants ensure that drive commissioning is straightforward. The functions needed for most pumping systems can be easily implemented with the pre-programmed macros. Starting up a pumping system and optimising its performance is extremely easy.

Highlights

- Optimal pump control for various applications
- Intelligent solution for controlling pump performance
- Remote monitoring and diagnostics
- Pump auto change
- Full multipump software now available
- Flow measurement included in the product, ideal for leak detection and a low cost
- Anti-rag pump cleaning algorithms
- Easy and cost-effective cabinet assembly
- Rapid and simple pumping system start-up
- Advanced energy efficiency in pumping systems
- Maximised process uptime
- Lifecycle support

Main features

Feature	Advantage	Benefit
Direct torque control	Premium motor control platform	Lower losses, improved energy saving
Soft pipe filling	Provides a pump with a smooth build-up of flow in pipes	This avoids pressure peaks and reduces the stresses on weak or ageing water mains when demand changes
Pump cleaning or anti-jam	Used in wastewater pumping stations to prevent pump and pipe clogging and expensive maintenance activities	The function can be set to trigger against different commands e.g on each pump start; on monitoring if the pump is becoming blocked; in response to a digital input or PLC command. If the pump cleaning function runs too often, an alarm is raised
Flow calculation	The drive has a flow meter routine that very accurately determines the flow rate within a process	Avoids the need for costly external flow meters and is suitable for applications where the flow data is not needed for invoicing purposes
Level control	Used to effectively control the filling or emptying of water or wastewater storage tanks	Fast-ramp starting creates a flush effect to keep pipes clear. Users can define the "efficiency speed" based on the pumps best efficiency point
Multi-pump control	Optimal control of applications where several parallel pumps are operated together and the required flow rate is variable	Maintains stable process conditions optimising the speed and number of the pumps needed
Pump priority	Optimal control of applications where the consumption rate varies based on demand	Operate higher capacity pumps during daytime and smaller units at night. This allows pumps to be operated closer to their best efficiency point
Pump specific protection features	The protection functions indicate if the pre-defined process conditions change	Underload and overload functions are pre-defined across the speed range at five distinct points. Belt breaks or dry sumps can be detected
Safe torque-off	TÜV certified safely to SIL3	Remove contactor from MCC

ABB drive for water and wastewater

ACQ810 – Variants, ratings, types, voltages and prices

The ACQ810 is available in several frame sizes to optimise the packing density ensuring MCC cabinet line-ups are as compact as possible. Minimised MCC line-ups mean that compliant bids to the water industry are as small as possible whilst still complying with EMC and thermal requirements.
Frame A and B – EMC external but plug-in, so no extra cabling required. Drives can be horizontally mounted for smaller compartments.
Frame C to E – EMC and harmonics choke built into the unit, so most compact size with no extra items to fit or cable.
Frame G1 and G2 – New high power design, mounted on wheels for easy manual handling. Removeable cabling boxes ensure power cables are fitted only once.

380 to 480 V, 3–phase supply voltage

Light overload		No overload use	Max	Frame	Fuses	Heat	Cooling	Type	MCC	IP20
P_N	I_{2N}	$I_{cont. max}$	output		A	dissipation	requirements		mounting	Price
kW	A	A	A		†Type gG	W	m³/h		kits	
1.1	2.7	3	4.4	A	6	100	24	ACQ810-04-02A7-4	+J410	
UL	3	3.6	5.3	A	6	106	24	ACQ810-04-03A0-4	+J410	
1.5	3.5	4.8	7	A	10	126	24	ACQ810-04-03A5-4	+J410	
2.2	4.9	6	8.8	A	10	148	24	ACQ810-04-04A9-4	+J410	
3	6.3	8	10.5	A	16	172	24	ACQ810-04-06A3-4	+J410	
4	8.3	10.5	13.5	B	16	212	48	ACQ810-04-08A3-4	+J410	
5.5	11	14	16.5	B	20	250	48	ACQ810-04-11A0-4	+J410	
7.5	14.4	18	21	B	25	318	48	ACQ810-04-14A4-4	+J410	
11	21	25	33	C	25	375	142	ACQ810-04-021A-4	+J410	
15	28	30	36	C	32	375	142	ACQ810-04-028A-4	+J410	
18.5	35	44	53	C	50	541	200	ACQ810-04-035A-4	+J410	
22	40	50	66	C	50	646	200	ACQ810-04-040A-4	+J410	
30	53	61	78	D	63	840	290	ACQ810-04-053A-4	+J410	
37	67	78	100	D	80	1020	290	ACQ810-04-067A-4	+J410	
45	80	94	124	D	100	1200	290	ACQ810-04-080A-4	+J410	
55	98	103	138	E0	125	1190	168	ACQ810-04-098A-4	+J410	
75	138	144	170	E0	160	1440	405	ACQ810-04-138A-4	+J410	
90	162	202	282	E	250	2310	405	ACQ810-04-162A-4	+J410	
110	203	225	326	E	250	2810	405	ACQ810-04-203A-4	+J410	
132	240	260	326	E	315	3260	405	ACQ810-04-240A-4	+J410	
160	286	290	348	E	315	4200	405	ACQ810-04-286A-4	+J410	
200	377	387	470	G1	Δ630	4403	1200	ACQ810-04-377A-4	+J410 +H381	
250	480	500	560	G1	Δ800	5602	1200	ACQ810-04-480A-4	+J410 +H381	
315	570	580	680	G1	Δ1000	6409	1200	ACQ810-04-570A-4	+J410 +H381	
355	634	650	730	G1	Δ1000	8122	1200	ACQ810-04-634A-4	+J410 +H381	
400	700	710	850	G2	Δ1250	8764	1200	ACQ810-04-700A-4	+J410 +H381	
450	785	807	1020	G2	Δ1400	9862	1200	ACQ810-04-785A-4	+J410 +H381	
500	857	875	1100	G2	Δ1400	10572	1420	ACQ810-04-857A-4	+J410 +H381	

To ensure ABB can tailor the drive to your needs, price on application

I_{2N} - Nominal output current. 110% overload 1 min / 5 min. I_{cont} - Continuous rms output current with no overload capacity
UL = UL - NEMA rated motor - no IEC motor equivalent, however the current rating may be useful
† For fuse selection, refer to the hardware manual, weak networks may require aR fuses
Δ These fuses are aR type, gG fuses not recommended for this frame size

ABB drive for water and wastewater

ACQ810 – Dimensions, I/O and options

Dimensions and weights

Frame size	Height [1] mm	Depth [2] mm	Width mm	Weight kg
A	364	219	94	3.3
B	380	297	101	5.4
C	567	298	166	15.6
D	567	298	221	21.3
E0	602	376	276	34
E	700	465	312	67
G	1,564	571	562	200
G1	1,462 (1,560)	505 (515)	305 (329)	161 (191)
G2	1,662 (1,710)	505 (515	305 (329)	199 (229)

( ) = Dimensions with optional cable boxes

Notes

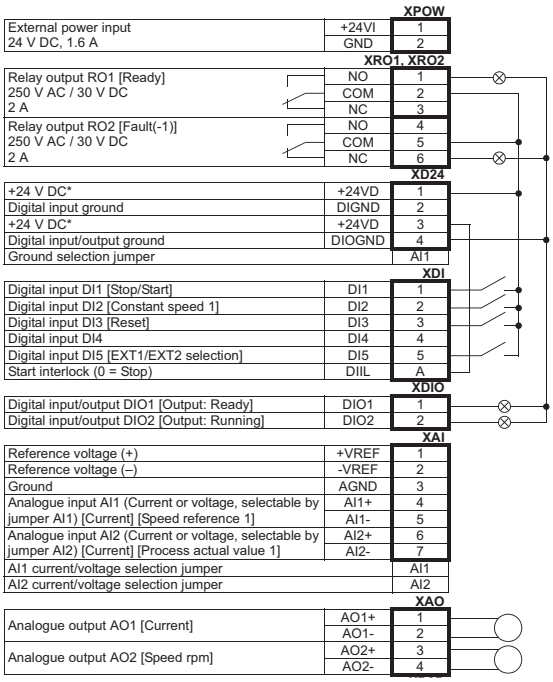
All dimensions and weights are without options

[1] Height is the maximum measure without clamping plates. In A and B frames the external C3 EMC-filter adds 160mm to the height. (The EMC filter does not have to be plugged in, it can be sited nearby) EMC-filter is internal in frames C, D, E0 and G

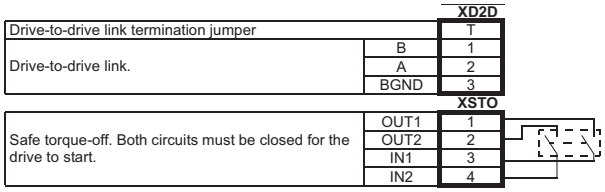
[2] Total depth with control panel, 10mm less with keypad removed

[1] [2] These notes do not apply to the G1 and G2 frames

Typical I/O connections


XPOW
External power input 24 V DC, 1.6 A
+24VI 1
GND 2
XRO1, XRO2
Relay output RO1 [Ready] 250 V AC / 30 V DC 2 A
NO 1
COM 2
NC 3
Relay output RO2 [Fault(-1)] 250 V AC / 30 V DC 2 A
NO 4
COM 5
NC 6
XD24
+24 V DC* +24VD 1
Digital input ground DIGND 2
+24 V DC* +24VD 3
Digital input/output ground DIOGND 4
Ground selection jumper AI1
XDI
Digital input DI1 [Stop/Start] DI1 1
Digital input DI2 [Constant speed 1] DI2 2
Digital input DI3 [Reset] DI3 3
Digital input DI4 DI4 4
Digital input DI5 [EXT1/EXT2 selection] DI5 5
Start interlock (0 = Stop) DIIL A
XDIO
Digital input/output DIO1 [Output: Ready] DIO1 1
Digital input/output DIO2 [Output: Running] DIO2 2
XAI
Reference voltage (+) +VREF 1
Reference voltage (–) -VREF 2
Ground AGND 3
Analogue input AI1 (Current or voltage, selectable by jumper AI1) [Current] [Speed reference 1] AI1+ 4
AI1- 5
Analogue input AI2 (Current or voltage, selectable by jumper AI2) [Current] [Process actual value 1] AI2+ 6
AI2- 7
AI1 current/voltage selection jumper AI1
AI2 current/voltage selection jumper AI2
XAO
Analogue output AO1 [Current] AO1+ 1
AO1- 2
Analogue output AO2 [Speed rpm] AO2+ 3
AO2- 4

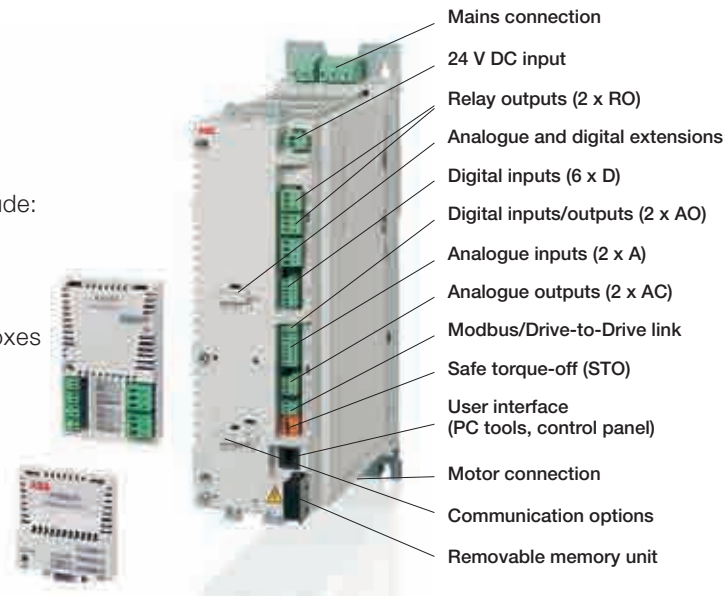
Typical STO and drive-to-drive link connections



STO stands for safe torque-off and is certified by TÜV to SIL3 to IEC61508.

STO can be used to guarantee no mechanical rotation (no torque) at the shaft of the motor and thus allows MCC panels to be built without the need for the traditional contactor, where maintenance of the rotating machinery is a requirement. Electrical isolation will only be required for working on the drive or the electrical connections of the motor, so the traditional door isolator will suffice for that requirement.

ACQ810 main connections overview



Options

A number of control panel mounting options are available, to optimise MCC design. The drive is normally delivered with a control panel and holder fitted as standard. Other options include:

- No control panel at all
- Control panel door mounting kit
- No cover at all for the drive unit
- The new G1 and G2 frames can be ordered with cabling boxes (providing surrounding) which allow easier module removal

Other options for the ACQ810 include:

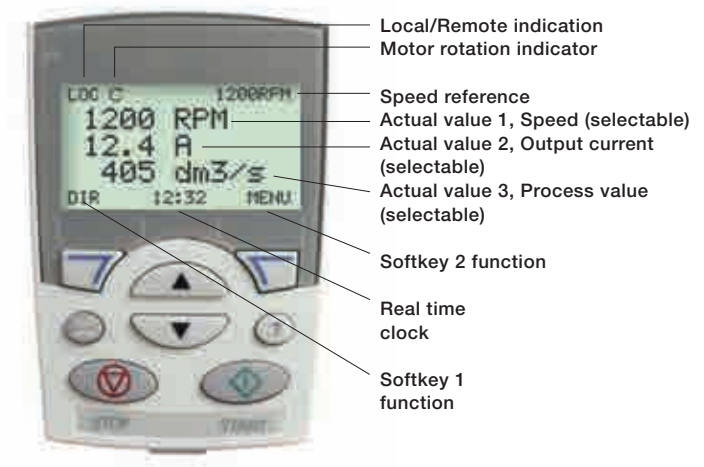
- Analogue I/O extension module
- Analogue and digital extension module
- Relay I/O extension module
- Extensive range of plug-in fieldbus modules
- External du/dt filters if required

ABB drive for water and wastewater

ACQ810 – User interfaces

Assistant keypad

For easy drive programming, a detachable, multilingual alphanumeric Assistant control panel is preferred as standard. The control panel has various assistants and a built-in help function to guide the user. It includes a real-time clock, which can be used during fault logging and in controlling the drive, such as start/stop. The control panel can be used for copying parameters for back-up or for downloading to another drive. A large graphical display and softkeys make it extremely easy to navigate.



	Name	Function
	Start	Initiates operation of drive
	Stop	Ceases operation of drive
	Up	Changes parameters and their value/ increases reference
	Down	Changes parameters and their value/ decreases reference
	Loc/Rem	Changes drive state from local control (control panel) to remote control (I/O or other external source)
	HELP	Built-in “Help” button
	Softkey 1	Function changes according to state of panel
	Softkey 2	Function changes according to state of panel

Keypad door mounting platform

Designed to hold the keypad so that it can be attached to the MCC door. An IP54 variant is also available for higher IP requirements.

Removable memory unit

The memory unit stores the complete parameter and firmware set for the drive. Should a drive need to be replaced, swapping the memory unit to the new drive will transfer a complete drive set-up – absolutely no recommissioning is required. This reduces down time in the event of a problem.

Expansion for analogue and digital I/O

Additional I/O can be added to the ACQ810. This I/O can be addressed by the fieldbus so that the ACQ810 can be used as an I/O “nest”, or of course the I/O can be used to simply allow more connectability from the process to the drive, for example, flow or level transducers.

EMC filters – frames A and B

Pluggable EMC filters for frame sizes A and B can be plugged directly into the drive, or can be mounted next to the drive on the end of a plug and socket cable – easy to install and mount.

Fieldbus interfaces

Extensive range of plug-in fieldbus interfaces, allowing connection to Profibus, DeviceNet, CanOpen, Modbus RTU and Ethernet.

DriveStudio PC tool

DriveStudio is a parameterisation and commissioning tool used to set-up and commission the water and wastewater drive. Monitoring and diagnostic facilities are included, as well as a local control panel. Wizards are included to guide the user through the most commonly performed tasks.

DriveSPC PC tool

DriveSPC (Solution Program Composer) allows access to the extended programming area of the ACQ810. Application specific IEC 61131 solution programmes can be generated and stored inside the drive. This way the drive can be tailored to the application and fully utilise the extended I/O.

ABB industrial drive

0.55 kW to 2,800 kW, ACS800

Motor control method - DTC

208/240 V, 3-phase, powers dependent on range

380/415 V, 3-phase, powers dependent on range

380/500 V, 3-phase, powers dependent on range

525/690 V, 3-phase, powers dependent on range

What is an ABB industrial drive?

ABB industrial drives are highly flexible AC drives that can be customised to meet the precise needs of many industrial applications. The drives cover a wide range of powers and voltages, including voltages up to 690 V. ABB industrial drives can be built in a number of differing formats: wall mounted, free standing, cabinet, industrial kits, multidrives or liquid cooled. This section describes the most popular styles. Page 41 describes other variants. Order-based customisation is an integral part of the offering.

Where can it be used?

The ABB industrial drive is equipped with the premium motor control platform, DTC, and as such is ideally suited for the most demanding industrial applications, like high performance centrifuges as well as constant torque applications such as cranes, winders, hoists, extruders and heavy conveyors. Applications with high breakaway torque, like rubber mixers and highly precise applications like paper machines and engine dynamometers are easily handled. The drive has ATEX certification with ABB's Ex d, Ex de, Ex nA and Ex tD motors and has marine certification for Lloyds, DNV and ABS.

Highlights

- Build-to-order product can be tailored for the needs of the application
- Blanket ATEX certification (Ex) with ABB motors
- Specialised software variants for selected applications
- Adaptive programming - like having a small PLC inside
- Common user and process interface with fieldbus
- Common software tools for sizing and commissioning
- 6-pulse, 12-pulse, low harmonic, 4Q, air-cooled, water-cooled, flange mounting
- Innovative hardware variants
- DTC (direct torque control) superior motor performance
- Flexibility to programme more advanced applications

Main features

Feature	Advantage	Benefit
Direct torque control (DTC)	Full torque at zero speed without encoder Accurate speed and torque control	Consistently excellent performance ensures that drive is not the limiting factor in process
Built-to-order	Customer can specify a wide range of options and build variants. Loaded with application specific software	Always meets application needs, tailored for the customer
Adaptive programming	Small PLC inside your drive as standard. 15 programmable function blocks. Up to 200 blocks by loading 'multiblock'	Needs no additional hardware or PC tool Adapt the drive to the specific needs of the project
Dedicated software loading packages	Industry specific software, fully researched, factory written and fully supported e.g. crane, winder, winch etc	Solve the application with very little effort
Application macros	Popular I/O configurations, pre-written sets	Fast settings for many applications
Brake choppers (where ordered)	Brake chopper fits internally (smaller space)	Reduced costs, high performance, internal monitoring No additional space or installation time needed
Safe torque-off option	TÜV approved safety feature SIL2/PL d	Satisfies the need for latest machinery directive (when ordered)
Low peak volts and du/dt	Motor peak voltage and rate of rise meets IEC 60034-17	Kind to motor windings
Compact size	Contains EMC filter and harmonic chokes inside the drive	No extra space or cabling is needed
Cooling fan	Silent long-lifetime cooling fan that switches on and off	Reduced maintenance, time and running costs
EMC	2nd environment RFI filters as standard 1st environment optional	No need for additional external filtering, additional space, or additional cabling between drives and filter
Fieldbus gateway	Snap-on module that is easily mounted inside drive	Automation system independent of drive company
I/O	Extensive and flexible standard and expansion I/O provides additional analogue or digital connections	No need for additional space or cabling
Start-up assistant	Guides user through all essential settings without going to parameter list	Easy set-up of parameters, your own language, on-line info system always available
Huge range of hardware variants	Special variants for wall, cabinet mount, 4Q, low harmonic, pre-built cabinets, drive kits, water-cooled	There is always an ABB industrial drive variant that fits the specification and requirements
Liquid cooled drives	Most compact fully enclosed drive on the market Fully certified for marine use	Low losses to control room, low noise, totally enclosed for harsh environments

ABB industrial drive

ACS800 – Variants, ratings, types, voltages and prices

Wall-mounted single drives
Series ACS800-01

– 0.55 kW - 160 kW, (230 - 690 V)
– 55 percent size reduction at 160 kW
– IP21 as standard, IP55 as option
– Wide range of built-in options
– Optional cable box for SWA cables
– Coated boards and internal I/O options
– Built-in brake chopper
– EMC filter for 1st environment, restricted distribution according to EN 61800-3 - optional
– EMC filter for 2nd environment, unrestricted distribution according to EN 61800-3 - standard
– Internal fieldbus options
– ACS800-01 is type tested for marine applications
– Blanket certification with ABB ATEX motors

For further information, see Technical Catalogue 3AFE 68375126 EN

380, 400 or 415 V, 3-phase supply voltage. The power ratings are valid at nominal voltage (400 V)

No-overload use		Light overload		Heavy-duty use		Max output	Frame	Fuse	Heat dissipation	Cooling requirements	Type (+E200 to order EMC filter +E210 for R6 frame)	IP21 Price with keypad	IP55 Price with keypad
$P_{cont.\ max}$ kW	$I_{cont.\ max}$ A	P_N kW	I_N A	P_{hd} kW	I_{hd} A	A		†Type gG	W	m^3/h			
1.5	5.1	1.5	4.7	1.1	3.4	6.5	R2	10	100	35	ACS800-01-0003-3	£1,122	£1,318
2.2	6.5	2.2	5.9	1.5	4.3	8.2	R2	10	120	35	ACS800-01-0004-3	£1,167	£1,363
3	8.5	3	7.7	2.2	5.7	10.8	R2	10	140	35	ACS800-01-0005-3	£1,247	£1,443
4	10.9	4	10.2	3	7.5	13.8	R2	16	160	35	ACS800-01-0006-3	£1,415	£1,611
5.5	13.9	5.5	12.7	4	9.3	17.6	R2	16	200	35	ACS800-01-0009-3	£1,561	£1,757
7.5	19	7.5	18	5.5	14	24	R3	20	250	69	ACS800-01-0011-3	£1,745	£2,007
11	25	11	24	7.5	19	32	R3	25	340	69	ACS800-01-0016-3	£2,004	£2,266
15	34	15	31	11	23	46	R3	40	440	69	ACS800-01-0020-3	£2,329	£2,591
22	44	18.5	41	15	32	62	R4	50	530	103	ACS800-01-0025-3	£2,768	£3,116
30	55	22	50	18.5	37	72	R4	63	610	103	ACS800-01-0030-3	£3,163	£3,511
37	72	30	69	22	49	86	R5	80	810	250	ACS800-01-0040-3	£3,460	£3,833
45	86	37	80	30	60	112	R5	100	990	250	ACS800-01-0050-3	£4,180	£4,553
55	103	45	94	37	69	138	R5	125	1190	250	ACS800-01-0060-3	£4,911	£5,284
75	145	75	141	45	100	170	R5	160	1440	405	ACS800-01-0075-3	£5,271	£5,644
90	166	75	155	55	115	202	R6	200	1940	405	ACS800-01-0100-3	£6,698	£7,306
110	202	90	184	75	141	282	R6	224	2310	405	ACS800-01-0120-3	£7,923	£8,531
110	225	110	220	90	163	326	R6	250	2810	405	ACS800-01-0135-3	£8,061	£8,669
132	260	132	254	110	215	326	R6	315	3260	405	ACS800-01-0165-3	£9,871	£10,479
160	290	160	285	132	234	351	R6a	315	4200	405	ACS800-01-0205-3	£11,643	£12,251

† For fuse selection, refer to the hardware manual, weak networks may require aR fuses
Prices include 2nd environment EMC filter and control panel
Other ratings and voltages are available, 230 V, 500 V, 690 V. Price on application
R6a frame denotes a slightly different physical dimension

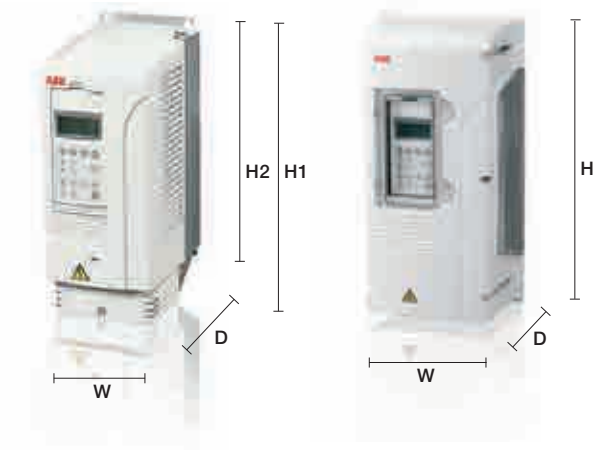
ABB industrial drive

ACS800-01 – Dimensions and options

Dimensions and weights

	IP21					IP55			
Frame size	H1 mm	H2 mm	W1 mm	Depth mm	Weight kg	H mm	W mm	Depth mm	Weight kg
R2	405	370 [1]	165	226	9	528	263	241	16
R3	471	420 [1]	173	265	14	528	263	273	18
R4	607	490 [1]	240	274	26	774	377	278	33
R5	739	602 [1]	265	286	34	775	377	308	51
R6	880	700 [1]	300	399	67	923	420	420	77
R6a	977	700 [1]	300	399	70	923	420	420	77

H1 = Height with cable connection box
H2 = Height without cable connection box
R6a shown to highlight different dimensions only
[1] ACS800-01 without cable connection box does not fulfil IP21 requirements



IP21 **IP55**

Options for ACS800-01

ACS800-01 is a wall mounted drive, so the options fit inside:
- IP55 variant
- UK gland box to accommodate SWA cable
- Different levels of EMC compliance
- SIL2/PL d safe torque-off interface (unit mounts outside the drive)
- Coated boards
- Extended warranty
- Marine certification mounts and kits

All ABB industrial drives use the same common options and user interfaces. These are detailed on page 43.
- The drive has two slots for I/O and fieldbus expansion and one optical interface slot (an additional mother board can also be added – giving three more slots)
- I/O modules can be chosen from analogue expansion, digital expansion, encoder and resolver feedback options
- Fieldbus modules are always fixed to slot 1 and all of the major industrial fieldbus modules are available
- The drive can be ordered with specially designed application specific software variants. There are 17 variants available. For example, crane, master-follower, winder control, etc. The advantage of selecting these pre-written software variants, is that they have been written to cover the market requirements, they are tested and certified by the factory and come complete with a user manual and cabling instructions.

User interfaces

Please refer to page 43 for details of the ACS800 common user interfaces.

ABB industrial drive

ACS800 – Variants, ratings, types, voltages and prices

Single drive modules for cabinets
Series ACS800-04 and ACS800-04M

– Specifically designed for system integration
– 0.55 kW - 1,900 kW (230 V - 690 V)
– IP00 kits or IP20 modules depending on frame size
– R1-R6 frames are back sheet mounted; R7 and R8 stands on cabinet floor; R8i wheels into the cabinet
– Easy access to power terminals: plug connections on wheeled D4 and R8i units
– Side-by-side mounting (excl. versions with side exit)
– Extensive, programmable I/O with galvanically isolated inputs
– Three I/O and fieldbus extension slots inside
– ACS800-04M can be ordered as disassembled kit of parts to optimise the items purchased (R7 and R8 frames)
– Rittal assembly kits available for easy cabinet integration
– Service 'skateboard' for R7, R8 frames

The R7 and R8 modules are detailed below, please contact ABB for information on the other frame sizes shown here.

For further information, see Technical Catalogue 3AFE68404592

380, 400 or 415 V, 3-phase supply voltage. The power ratings are valid at nominal voltage (400 V)

No-overload use		Light overload		Heavy-duty use		Max output	Frame	Fuse	Heat dissipation	Cooling requirements	Type (+E210, +J400 and +J410 to order EMC and keypad)	IP00 Price with keypad*
$P_{cont.\ max}$ kW	$I_{cont.\ max}$ A	P_N kW	I_N A	P_{hd} kW	I_{hd} A	A		†Type gG	W	m³/h		
110	206	110	202	90	163	326	R7	250	3000	540	ACS800-04-0140-3	£7,246
132	248	132	243	110	202	404	R7	315	3650	540	ACS800-04-0170-3	£8,799
160	289	160	284	132	240	432	R7	315	4300	540	ACS800-04-0210-3	£10,374
200	445	200	440	160	340	588	R8	500	6600	1220	ACS800-04-0260-3	£12,315
250	521	250	516	200	370	588	R8	630	7150	1220	ACS800-04-0320-3	£14,227
315	602	315	590	250	477	840	R8	630	8100	1220	ACS800-04-0400-3	£16,174
355	693	355	679	315	590	1017	R8	800	8650	1220	ACS800-04-0440-3	£18,346
400	720	400	704	355	635	1017	R8	800	9100	1220	ACS800-04-0490-3	£20,899

Other ratings and voltages available on application, 230 V, 500 V, 690 V
Drive can be purchased pre-assembled or as a disassembled kit, where parts can be omitted for cost optimisation by panel builders (R7, R8 frames)

Price includes 2nd environment EMC filter, control panel and door mounting kit
Multiple control panel mounting options - please ask.
* Comes with keypad and a door mount kit (+J400, +J410)
† For fuse selection, refer to the hardware manual. Weak networks may require aR fuses

Dimensions and weights

	Bookshelf mounting				Flat-type mounting			
Frame size	H mm	W mm	D mm	Weight kg	H mm	W mm	D mm	Weight kg
R7	1121	427†	473	100	1152	632	259	100
R8	1564	562†	568	205	1596	779	403	205

† R7 module only 250mm wide, R8 module only 350mm wide

Options for ACS800-04

When purchased as an ACS800-04, the kit always contains pedestal, busbars, power module, control module and keypad. If purchased as an ACS800-04(M) then it is possible to tailor the offering, remove busbars, have left or right handed or flat or bookcase orientation.

User interfaces

Please refer to page 43 for details of the ACS800 common user interfaces.

ABB industrial drive

ACS800 – Variants, ratings, types, votages and prices

Cabinet-built drives (air- and liquid-cooled)

Series ACS800-07

- 45 kW - 2,800 kW, (380 - 690 V)
- IP21 as standard, IP22, IP42, IP54 and IP54R as options
- Up to 500 kW based on a single module including rectifier and inverter
- Above 500 kW separate rectifier and inverter modules that have plug-in power connectors for easy maintenance and redundancy. Modules wheel-in and -out of cabinet
- 6- or 12-pulse operation as standard (>500 kW)
- Extremely compact, internal swinging gate for control options
- Factory-built cabinet with EMC and thermally type-tested for trouble-free operation
- Extensive range of standard options
- ATEX approved PTC interfaces and blanket certification with ABB motors
- TÜV approved emergency stopping options

For further information, see Technical Catalogue 3AFE68375126

The ACS800-07 cabinet drive range covers an extensive power and options range. The drives shown in the table are for the basic IP21 build format and only up to 400 kW. Please contact ABB to discuss the exact requirements of your factory built and certified cabinet, to ensure all relevant options are catered for.

Liquid-cooled option

ACS800-07 can also be supplied in a liquid cooled format, ACS800-07LC, please refer to page 41 for details.

380, 400 or 415 V, 3-phase supply voltage. The power ratings are valid at nominal voltage (400 V)

No-overload use		Light overload		Heavy-duty use		Max output	Frame	Fuse	Heat dissipation	Cooling requirements	Type	Price
$P_{cont.\ max}$ kW	$I_{cont.\ max}$ A	P_N kW	I_N A	P_{hd} kW	I_{hd} A	A		A † Type aR	W	m^3/h		
75	145	75	141	45	100	170	R5	315	1440	405	ACS800-07-0075-3	
90	166	75	155	55	115	202	R6	315	1940	405	ACS800-07-0100-3	
110	202	90	184	75	141	282	R6	400	2310	405	ACS800-07-0120-3	
110	214	110	220	90	163	326	R6	500	2570	405	ACS800-07-0135-3	
132	260	132	254	110	215	326	R6	550	3260	405	ACS800-07-0165-3	
160	290	160	285	132	234	351	R6	550	4200	405	ACS800-07-0205-3	
200	445	200	440	160	340	588	R8	800	6600	1220	ACS800-07-0260-3	
250	521	250	516	200	370	588	R8	1000	7150	1220	ACS800-07-0320-3	
315	602	315	590	250	477	840	R8	1250	8100	1220	ACS800-07-0400-3	
355	693	355	679	315	590	1017	R8	1400	8650	1220	ACS800-07-0440-3	
400	720	400	704	355	635	1017	R8	1400	9000	1220	ACS800-07-0490-3	

ABB panels can be ordered with a wide range of standard options. Price on application

Other ratings and voltage ranges available, 230 V, 500 V, 690 V.
Price on application
Includes 2nd environment EMC filter and control panel and can include many other factory fitted options
† For fuse selection, refer to the hardware manual

ABB industrial drive

ACS800-07 – Dimensions and options

Dimensions and weights, cabinet built (air-cooled)

Frame size	*Width with fuse switch	Height IP 21/22/42	Height IP54	Depth	*Depth top entry/exit	Weight (kg) with line fuse switch
R5/R6	430	2130	2315	645	646	300
R8	830	2130	2315	646	646	500

ACS800-07 can be supplied with an extensive range of standard cabinet options. Contact your ABB representative for details
*some of these options alter the cabinet dimensions
Higher power standard and bespoke cabinets can be quoted on request

Larger powers are built with D4 and R8i modules. Ratings and dimensions available on request.

Options for ACS800-07

ACS800-07 is a cabinet drive, so its options fit inside the cabinet. The cabinet drive can be fitted with:

- IP21, 22, 42, 54, 54R variants (no IP55)
- Emergency stop variants, TÜV approved
- Motor thermistor relays
- ATEX-approved motor protection
- Marine construction
- UL approved components
- Various types of cable markings, cabinet heaters, door furniture and lighting etc.
- Sine filter fitted to output (for older motors)
- Top or bottom cable entry for either motor or power cables
- UK gland plates for SWA cables
- 110 V control inside the cabinet
- Different levels of EMC compliance
- Extended warranty
- Additionally, ABB can accommodate any specialised option or feature by using its in-house application design team

ACS800-07 also comes with options that are fitted to the drive module which is inside the cabinet:

- SIL2 safe torque-off interface
- Coated boards

User Interfaces

All ACS800s use the same common options and user interfaces. These are detailed on page 43

- The drive has two slots for I/O and fieldbus expansion and one slot for an optical interface (an additional mother board can also be added – giving three more slots)
- I/O modules can be chosen from analogue expansion, digital expansion, encoder and resolver feedback options
- Fieldbus modules are always fixed to slot 1 and all of the major industrial fieldbus modules are available
- The drive can also be ordered with specially designed application specific software variants. There are 11 variants available, for example, crane, master follower, winder control, etc. The advantage of selecting these pre-written software variants is that they have been written to cover the market requirements, they are tested and certified by the factory, and come complete with a user manual and cabling instructions.

ABB industrial drive

ACS800 – Variants, ratings, types, voltages and prices

DTC DIRECT TORQUE CONTROL

Low harmonic, active rectifier drives

Wall-mounted and cabinet-built

A dedicated range of low harmonic drives based on active rectifier technology. No regenerative capability ensures no mistakes on generator supplies, still retaining a low 2-4 percent total harmonic distortion (THD) signature.

Series ACS800-31, wall-mounted

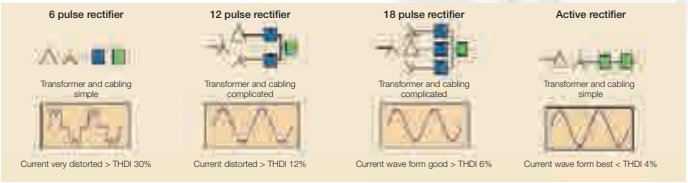
– 5.5 kW - 110 kW (230 - 690 V)
– IP21 as standard
– Single package for easy cabinet installation, reducing installation time and cabinet space

Series ACS800-37, cabinet-built

– Power range from 37 kW to 2700 kW (230 to 690 V)
– IP21 as standard; IP22, IP42, IP54 and IP54 R available as options
– Wheel-out power modules for improved manual handling
– Plug-in power connectors for easy maintenance and redundancy
– Power module redundancy for improved availability
– Factory-built cabinets ensure good installation

The R5 and R6 modules are detailed below. Please contact ABB if you require higher powers. Also, fully regenerative products are available called ACS800-11 and ACS800-17. Please refer to page 41 for more information.

For further information, see Technical Catalogue 3AFE68375126


6 pulse rectifier
Transformer and cabling simple
Current very distorted > THDI 30%
12 pulse rectifier
Transformer and cabling complicated
Current distorted > THDI 12%
18 pulse rectifier
Transformer and cabling complicated
Current wave form good > THDI 6%
Active rectifier
Transformer and cabling simple
Current wave form best < THDI 4%

Alternatives in reducing line harmonics

Low harmonic, wall-mounted drives - ACS800-31

380, 400 or 415 V, 3-phase supply voltage. The power ratings are valid at nominal voltage (400 V)

No-overload use		Light overload		Heavy-duty use		Max output	Frame	Fuse	Heat dissipation	Cooling requirements	Type (+E200 to order the EMC filter)	IP21 Price with keypad
$P_{cont.\ max}$ kW	$I_{cont.\ max}$ A	P_N kW	I_N A	P_{hd} kW	I_{hd} A	A		A †Type gG	W	m^3/h		
15	34	15	32	11	26	52	R5	40	550	350	ACS800-31-0016-3	£4,119
18.5	38	18.5	36	15	34	61	R5	40	655	350	ACS800-31-0020-3	£4,616
22	47	22	45	18.5	38	68	R5	50	760	350	ACS800-31-0025-3	£5,245
30	59	30	56	22	45	90	R5	63	1000	350	ACS800-31-0030-3	£6,012
37	72	37	69	30	59	118	R5	80	1210	350	ACS800-31-0040-3	£7,081
45	86	45	83	30	65	137	R5	100	1450	350	ACS800-31-0050-3	£8,405
55	120	55	114	45	88	168	R6	125	1750	405	ACS800-31-0060-3	£9,631
75	150	75	143	55	117	234	R6	160	2350	405	ACS800-31-0070-3	£11,198
90	165	75	157	75	132	264	R6	200	2800	405	ACS800-31-0100-3	£12,864

Other ratings and voltage ranges available, 230 V, 500 V, 690 V. Price on application.
Price includes 2nd environment EMC filter and control panel
Prices for low harmonic cabinet drives ACS800-37 also available on application
† For fuse selection, refer to the hardware manual. Weak networks may require aR fuses

ABB industrial drive

ACS800-31 – Dimensions and options and ACS800-37 options

Dimensions and weights, ACS800-31

Frame size	Height mm	Width mm	Depth mm	Weight kg
R5	816	265	390	62
R6	970	300	440	100

Height includes cable box, one enclosure, no external items

Ratings and dimensions for larger variants available on request.

Options for ACS800-31, wall-mounted

- UK gland box to accommodate SWA cable
- Different levels of EMC compliance
- SIL2 safe torque-off interface (unit mounts outside the drive)
- Coated boards standard
- Extended warranty
- Marine certification mounts and kits

Options for ACS800-37, cabinet-built

Being cabinet drive, all of the options available for ACS800-31 are also valid, as they fit inside the cabinet. Additionally the cabinet drive can be fitted with:

- IP21, IP22, IP42, IP54, IP54R variants (no IP55)
- Emergency stop variants
- Motor thermistor relays
- ATEX-approved motor protection
- Marine construction
- UL approved components
- Various types of cable markings, cabinet heaters, door furniture and lighting etc.
- Sine filter fitted to output (for older motors)
- Top or bottom cable entry for either motor or power cables
- UK gland plates for SWA cables
- 110V control inside the cabinet
- Additionally, ABB can accommodate any specialised option or feature, by using its in-house application design team

ACS800-37 also comes with options that are fitted to the drive module which is inside the cabinet

- SIL2/PL d safe torque-off interface
- Coated boards

User interfaces

All ACS800s use the same common options and user interfaces, these are detailed on page 43.

- The drive has two slots for I/O and fieldbus expansion and one slot for an optical interface (an additional mother board can also be added – giving three more slots)
- I/O modules can be chosen from analogue expansion, digital expansion, encoder and resolver feedback options
- Fieldbus modules are always fixed to slot one, and all of the major industrial fieldbus modules are available
- The drive can also be ordered with specially designed application specific software variants. There are 11 variants available in all, for example, crane, master follower, winder control, etc. The advantage of selecting these pre-written software variants is that they have been written to cover the market requirements. They are tested and certified by the factory and come complete with a User Manual and cabling instructions.

Other ABB industrial drive variants

Regenerative, active rectifier drives

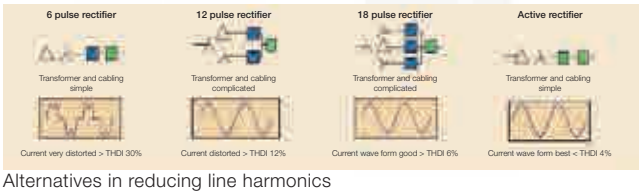
Series ACS 800-11, wall-mounted

- 5.5 kW to 110 kW (230 - 690 V)
- IP21 as standard
- Active rectifier unit
- Single package for easy cabinet installation, reducing installation time and cabinet space

For further information see Technical Catalogue 3AFE 68375126

Series ACS800-17, cabinet-built

- 45 kW - 2,500 kW (230 - 690 V)
- IP21 as standard, IP22, IP42, IP54 and IP54 R available as options
- Wheel-out power modules for improved manual handling
- Plug-in power connectors for easy maintenance and redundancy
- Power module redundancy for improved availability
- Factory-built cabinets ensure good installation and compliance with standards
- ATEX approved PTC interfaces and blanket certification with ABB motors


6 pulse rectifier
12 pulse rectifier
18 pulse rectifier
Active rectifier
Transformer and cabling simple
Transformer and cabling complicated
Transformer and cabling complicated
Transformer and cabling simple
Current very distorted > THDI 30%
Current distorted > THDI 12%
Current wave form good > THDI 6%
Current wave form best < THDI 4%

Alternatives in reducing line harmonics

Regenerative, active rectifier drive modules - low harmonic

Series ACS800-14

- 75 kW - 1,700 kW (380 - 690 V)
- IP00 kits
- Assembly kits for Rittal cabinets and generic cabinets
- Separate controllers for galvanic isolation
- Requires a separate +24 V DC supply at 3 A
- Active supply unit can be configured for low harmonic mode (2-4 percent harmonic distortion) or regenerative mode, for better dynamic performance
- Comprehensive installation instructions and CAD drawings

For further information see Technical Catalogue 3AFE 68404592

Liquid cooled modules

Series ACS800-x04LC

- Extremely compact size, compared to air-cooled
- 98 percent of drive losses transferred to liquid - removes the need for air conditioned control rooms
- Tested electrical/mechanical kits available - which make different solutions easy to build
- ACAD, PDF and full 3D ePLAN® modelling support
- Pre-designed mounting frames available to reduce design time
- Liquid / liquid-heat exchanger assemblies can be supplied by ABB
- Module features:
  - Diode supply modules include line side chokes
  - Inverter modules include du/dt filters
  - Easy structure, fewer components
  - Inverter units, IGBT supply units and dynamic braking units are based on one common R8i module

Inverter

Diode

For further information see Technical Catalogue 3AFE68404592

Other ABB industrial drive variants

Multidrives

A multidrive is a custom-made cabinet to suit a larger application or a process line. The cabinet contains multiple inverter stages of differing size, supplied from a common DC bus. The DC bus can be provided by a selection of supply units, diode, thyristor or IGBT (active supply unit).

Series ACS800 multidrive cabinets

– 1.5 kW - 5,600 kW, 380 - 690 V
– IP21 as standard, IP22, IP42 and IP54 as option
– Smaller power modules have high packing density, using a patented mounting arrangement
– Power modules on wheels for easy manual handling
– Plug-in power connectors for easy maintenance and redundancy
– Wide range of built-in options, including brake choppers, EMC filters, fuse switches, contactors, communication options etc
– ATEX approved PTC interfaces and blanket certification with ABB motors
– TÜV approved emergency stops

For further information see ACS800 Technical Catalogue 3AFE 68248531

Series ACS800 multidrive modules

– A range of IP20 module and IP00 kits to generate bespoke multidrive systems built into system integrators own panels
– Modules have no rectifiers, they are inverters only and range in frames from R2i to R8i (i=inverter only)
– Selection of rectifiers available to generate DC link for system. Diode, thyristor or active rectifier are available
– Cabinet kits for Rittal and generic, ensure easy integration
– ACAD, PDF and full 3D ePLAN® modelling support

For further information see Technical Catalogue 3AFE68404592

Liquid-cooled drives

Series ACS800 - 17LC and ACS800 - 37LC

– 37 kW - 2,700 kW, (380-690 V)
– IP42 as standard, IP54 as option
– ACS800 - 17LC, fully regenerative, ACS800 - 37LC, low harmonic
– Provides reliable operation in adverse conditions
– Silent and safe operation without the need for air ventilation or air conditioning, fully enclosed cabinets, smaller than previous generation
– Extensive range of cabinet options, including water pumping and heat exchanger cabinets
– Marine enclosure available
– Parallel modules allow redundant configuration
– Ideal where space is limited, in harsh environments, or at sites that require quieter operation, in applications where cooling water is freely available
– IEC, UL, CSA, Lloyds, DNV, ABS approvals
– ATEX-approved PTC interfaces and blanket certification with ABB motors

For further information see Technical Catalogue 3AFE68375126

ABB industrial drive

ACS800 – Common user interfaces

Control panel

The control panel features a full-text multilingual display. Dedicated keys allow fast access to actual signals, parameters, assistant functions and drive information. The panel can be used for parameter copying and for configuring adaptive programmes, working as a PLC inside the drive. Local motor control and parameter copying is also possible.

Panel mounting kits

Kits are available that allow mounting on the cabinet door, or in a holder inside the cabinet. The panel can be screwed to the cabinet door, without the need for an additional holder.

Fieldbus

The ACS800 supports an extensive list of fieldbus modules for connectivity to industrial networks.

I/O expansion

ACS800 can be fitted with a large range of analogue and digital I/O modules to expand its I/O capability.

DriveWindow - PC Tool

DriveWindow is a high specification, high speed commissioning, maintenance and monitoring tool for the ACS800 drive range. It operates over an optical fibre link. (Drive requires an RCDO module)

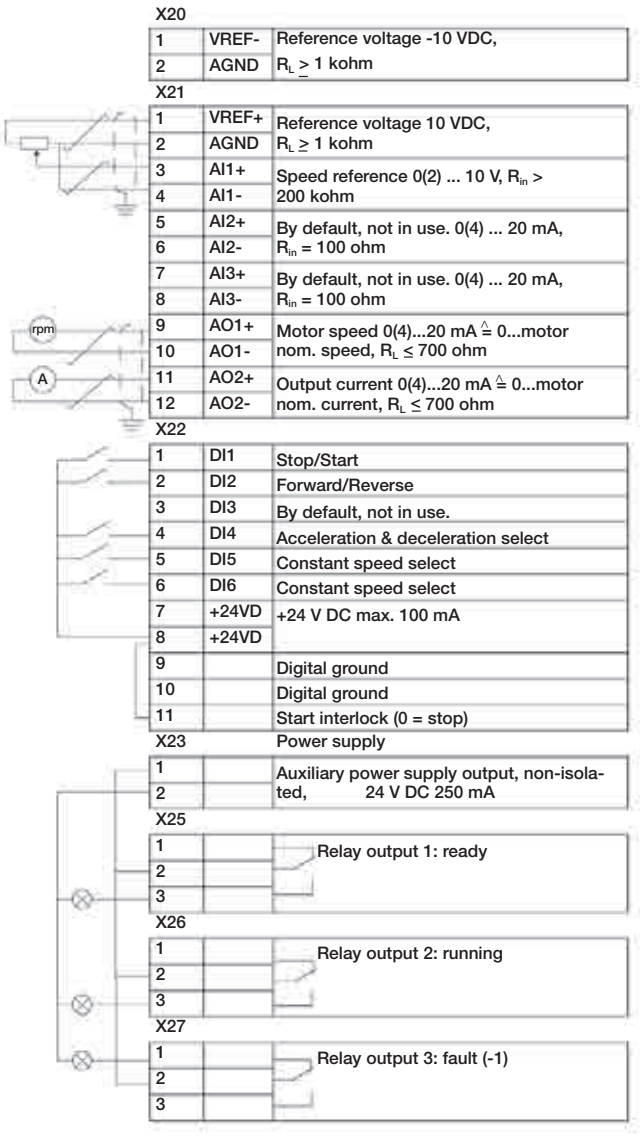
DriveAP - PC Tool

DriveAP allows access to the ACS800 adaptive, block programming environment.

Typical I/O and control connections

The ABB industrial drive family uses the same control card, keypad and software structure throughout its entire range. Analogue and digital I/O channels are used for different functions such as control, monitoring and measurement purposes (e.g. motor temperature). In addition, optional I/O extension modules are available providing additional analogue or digital I/O connections.

Below are the standard drive control I/O of the ABB industrial drive with factory macro. For other ACS800 application macros the functions may be different. Please refer to the firmware manual for details.



X20		
1	VREF-	Reference voltage -10 VDC,
2	AGND	$R_L \geq 1$ kohm
X21		
1	VREF+	Reference voltage 10 VDC,
2	AGND	$R_L \geq 1$ kohm
3	AI1+	Speed reference 0(2) ... 10 V, R_{in} >
4	AI1-	200 kohm
5	AI2+	By default, not in use. 0(4) ... 20 mA,
6	AI2-	R_{in} = 100 ohm
7	AI3+	By default, not in use. 0(4) ... 20 mA,
8	AI3-	R_{in} = 100 ohm
9	AO1+	Motor speed 0(4)...20 mA ≙ 0...motor
10	AO1-	nom. speed, $R_L \leq 700$ ohm
11	AO2+	Output current 0(4)...20 mA ≙ 0...motor
12	AO2-	nom. current, $R_L \leq 700$ ohm
X22		
1	DI1	Stop/Start
2	DI2	Forward/Reverse
3	DI3	By default, not in use.
4	DI4	Acceleration & deceleration select
5	DI5	Constant speed select
6	DI6	Constant speed select
7	+24VD	+24 V DC max. 100 mA
8	+24VD	
9		Digital ground
10		Digital ground
11		Start interlock (0 = stop)
X23		Power supply
1		Auxiliary power supply output, non-isola-
2		ted, 24 V DC 250 mA
X25		
1		Relay output 1: ready
2		
3		
X26		
1		Relay output 2: running
2		
3		
X27		
1		Relay output 3: fault (-1)
2		
3		

Next generation of ABB industrial drive

0.55 kW to 2800 kW, ACS880

Motor control method – DTC or Scalar

208 / 240 V, 3-phase supply, powers dependent on range

380 / 415 V, 3-phase supply, powers dependent on range

380 / 500 V, 3-phase supply, powers dependent on range

525 / 690 V, 3-phase supply, powers dependent on range

DTC DIRECT TORQUE CONTROL

What is the next generation ABB industrial drive?

The highly successful ACS800 range of drives have been completely redesigned and updated to form the next generation all-compatible range. The drive contains a new harmonised parameter set, taking its features from all of the best functions within the existing ABB drive's family, making it process compatible. The drive is programmed by the most intuitive and user-friendly keypad ABB has produced to date. A new PC tool is designed to incorporate all of the latest functionality that new operating systems bring, including a free-of-charge entry level version, making it compatible with all user types. The drive also contains the very latest 4th generation DTC motor control core, making the drive all compatible with any motor available in the market today including asynchronous, permanent magnet and synchronous reluctance (SynRM) are all controllable by the same software platform. Energy saving functions make it environmentally compatible.

Main features

Feature	Advantage	Benefit
Direct torque control (DTC)	Full torque at zero speed without encoder Accurate speed and torque control	Consistently excellent performance ensures that drive is not the limiting factor in the process
Intuitive modern keypad	High contrast, high definition display giving intuitive access to the drive parameters	Easy commissioning, programming, maintenance and fault finding
Start-up assistant	Guides user through all essential settings without going to parameter list	Easy set-up of parameters, your own language, on-line information system always available
Removable memory unit	Programme, parameter edits, motor calibrations and fault histories stored in the removable memory unit	Zero re-commissioning in case of drive failure, just move the memory unit, very short MTTR
Integrated, patented, TÜV approved safety module option	No need to use external programmable safety hardware for drive specific functions. The module carries out drive specific safety functionality more efficiently than external programmable devices, as they are designed to work directly with the drive. Patented safety monitoring functions allow the drive to undertake speed related safety functions with no additional speed feedback devices needed	Minimise installation time and space. Shorter design times using TÜV approved module. Drive specific safety functions save time and money as they are built in, and do not require additional speed monitoring devices to operate
Modern PC tools	Entry level (FOC) and pro level PC tools are available for commissioning, tuning, parameter management and monitoring	Keep copies of the parameters for back-up. Use the PC tools to optimise the application
Fieldbus gateway	Snap-on module that is easily mounted inside drive	Access to all major automation platforms
I/O extension modules	Additional I/O can be added to the drive	Easy addition of extra I/O to allow the drive to control the application properly
Speed feedback modules	A large array or high performance speed feedback devices can be interfaced to the drive via these modules	Higher performances can be achieved or position control can be undertaken
Energy monitoring and optimising features	Drive controls the motor voltage dependant on the load. Drive monitors the saved energy compared to equivalent DOL operation	Consumed energy optimised across the speed and load range. Energy savings presented in local currency and tonnes of CO_2
Drive-to-drive link	Built-in industrial control link	Built-in ability to undertake master-follower applications with no extra hardware

Next generation of ABB industrial drive

What is the next generation ABB drive? (cont)

The drive contains energy saving features like speed controlled cooling fans, energy optimising and monitoring software, making the drive compatible with the environment as well.

New innovations include built-in machinery safety functionality such as safe torque-off (STO) to SIL 3 PL e as standard. Other more complicated solutions can be realised with the plug-in safety functions module (see page 53 for more details). As with the existing ABB industrial drive range the next generation drives can be built in a number of differing formats: wall mounted, modules for cabinet installation, cabinets, industrial kits or multidrives. The range is growing as ABB increases this product offering, so please ask which variants are available to ensure the range covers your requirements. Meanwhile, the existing ABB industrial drive will remain in production for some years ahead.

Where can it be used?

The next generation ABB industrial drive is equipped with the 4th generation premium motor control platform, DTC, and as such is ideally suited for the most demanding industrial applications. Constant torque and torque at zero speed is perfect from the DTC core.

Suitable applications include cranes, winders, hoists, extruders and heavy conveyors. Applications with high breakaway torque, like rubber mixers and highly precise applications like paper machines and engine dynamometers are easily handled. The new motor control platform also allows control of every major AC motor type (including SynRM), so many and varied applications are possible.

Highlights – ACS880

- Built to order product can be tailored for the needs of the application
- Highly intuitive high contrast and high resolution keypad suitable for gloved hands
- Built-in safety functionality to satisfy the demands of IEC 62061 and ISO 13849-1
- Removable memory unit
- Flexibility to programme more advanced applications
- Common user and process interface with fieldbus
- Common software tools for sizing and commissioning
- Innovative hardware variants
- DTC (direct torque control) superior motor performance
- Energy efficiency counters
- Energy optimiser – optimises the motor control for the application
- Load analyser for optimised dimensioning of the drive, motor and process

Next generation of ABB industrial drive

ACS880 – Variants, ratings, types, voltages and prices

DTC DIRECT TORQUE CONTROL

Wall-mounted single drive
Series ACS880-01

- 0.55 kW - 250 kW, (208 - 690 V)
- Largest power wall-mounted drive on market
- Coated boards as standard
- TÜV approved safe torque-off (STO) to SIL 3 PL e standard
- IP21 as standard, IP55 as option
- IP55 variant same footprint as IP21 variant
- Brake chopper standard to R4 frame, option thereafter
- Wide range of built-in options
- Optional UK cable box option for SWA cables
- EMC filter for C3 category according to EN 61800-3 (2004) standard – category C2 optional
- Internal fieldbus options
- Optional safety module
- Optional I/O expansion
- ACS880 user interfaces described later

For further information, see Technical Catalogue 3AUA0000098111

380 to 415 V, 3-phase supply voltage. The power ratings are valid at nominal voltage (400 V)

No-overload (nominal) use		Light-duty use		Heavy-duty use		Max output	Frame		Fuse	Heat dissipation	Cooling requirements	Type (+ E200, + R700 + H358 to order EMC & SWA gland plate)	Price IP21	Price IP55 (+B056)
P_N kW	I_N A	P_{Ld} kW	I_{Ld} A	P_{hd} kW	I_{hd} A	A			† Type gG	W	m³/h			
0.75	2.4	0.75	2.3	0.55	1.8	3.1	R1		4	30	44	ACS880-01-02A4-3	£821	£962
1.1	3.3	1.1	3.1	0.75	2.4	4.1	R1		6	40	44	ACS880-01-03A3-3	£861	£1,002
1.5	4.0	1.5	3.8	1.1	3.3	5.6	R1		6	52	44	ACS880-01-04A0-3	£891	£1,081
2.2	5.6	2.2	5.3	1.5	4.0	6.8	R1		10	73	44	ACS880-01-05A6-3	£1,021	£1,211
3.0	8	3.0	6.8	2.2	5.6	9.5	R1		10	94	44	ACS880-01-07A2-3	£1,071	£1,261
4.0	10	4.0	8.9	3.0	7.2	12.2	R1		16	122	44	ACS880-01-09A4-3	£1,201	£1,391
5.5	12.9	5.5	12.0	4.0	9.4	16	R1		16	172	44	ACS880-01-12A6-3	£1,431	£1,621
7.5	17	7.5	16	5.5	12.6	21	R2		25	232	88	ACS880-01-017A-3	£1,517	£1,707
11	25	11	24	7.5	17	29	R2		32	337	88	ACS880-01-025A-3	£1,937	£2,191
15	32	15	30	11	25	42	R3		40	457	134	ACS880-01-032A-3	£2,217	£2,471
18.5	38	18.5	36	15	32	54	R3		50	562	134	ACS880-01-038A-3	£2,377	£2,631
22	45	22	43	19	38	64	R4		63	667	200	ACS880-01-045A-3	£2,703	£3,040
30	61	30	58	22	45	76	R4		80	907	200	ACS880-01-061A-3	£2,853	£3,190
37	72	37	68	30	61	104	R5		100	1117	280	ACS880-01-072A-3	£3,534	£3,896
45	87	45	83	37	72	122	R5		100	1120	280	ACS880-01-087A-3	£4,294	£4,656
55	105	55	100	45	87	148	R6		125	1295	435	ACS880-01-105A-3	£4,661	£5,023
75	145	75	138	55	105	178	R6		160	1440	435	ACS880-01-145A-3	£5,171	£5,533
90	169	90	161	75	145	247	R7		▵315	1940	450	ACS880-01-169A-3	£6,811	£7,173
110	206	110	196	90	169	287	R7		▵315	2310	450	ACS880-01-206A-3	£7,051	£7,641
132	246	132	234	110	206	350	R8		▵350	3300	550	ACS880-01-246A-3	£9,009	£9,599
160	293	160	278	132	246*	418	R8		▵400	3900	550	ACS880-01-293A-3	£11,189	£11,779
200	363	200	345	160	293	498	R9		▵550	4800	1150	ACS880-01-363A-3	£13,815	£14,496
250	430	250	400	200	363**	545	R9		▵630	6000	1150	ACS880-01-430A-3	£16,815	£17,496

*130% overload, **125% overload
† For fuse selection, refer to the hardware manual. Weak networks may require aR fuses
▵ These fuses are aR fuses, ABB does not recommend gG fuses on these larger drives
Note: Current rating match IE3 motor nameplates
Note: Prices include keypad, EMC filter and SWA gland plates and full manuals

Next generation of ABB industrial drive

ACS880-01 – Dimensions and options

Drive dimensions and weights wall mounted drives

Frame size	Height 1 IP21 (mm)	Height 2 IP21 (mm)	Width (mm)	Depth (mm)	Weight (kg)
R1	405	370	155	226	6
R2	405	370	155	249	8
R3	471	420	172	261	10
R4	573	490	203	274	18.5
R5	730	596	203	274	23
R6	726	569	251	357	45
R7	880	600	284	365	55
R8	963	681	300	386	70
R9	955	680	380	413	98

H1 - Height with cable entry box
H2 - Height without cable entry box
Width and depth with cable entry box

IP21

Frame size	Height 1 IP55 (mm)	Width IP55 (mm)	Depth IP55 (mm)	Weight IP55 (kg)
R1	450	162	295	6
R2	450	162	315	8
R3	525	180	327	10
R4	576	203	344	18.5
R5	730	203	344	23
R6	726	251	421	45
R7	880	284	423	55
R8	963	300	452	72
R9	955	380	477	100

IP55
Highly compact same physical size as IP21 variant

Options for ACS880-01

ACS880-01 is a wall-mounted drive, so all of the options fit inside:

- IP55 variant
- Extensive range of expansion I/O options
- Extensive range of motor feedback devices
- Extensive range of fieldbus options
- Built-in safety option module, TÜV approved
- UK gland box to accommodate SWA cable
- Different levels of EMC compliance
- Extended warranty

All ABB industrial drives use the same common options and user interfaces. These are detailed on page 53.

- The IP55 variant has been designed to occupy the same physical space as the IP21 unit, thus minimising wall space required to support this module.
- The drive has three slots for I/O and fieldbus expansion and one drive-to-drive serial communication link.
- I/O modules can be chosen from analogue expansion, digital expansion, encoder and resolver feedback options
- Fieldbus modules can be connected to any slot and all of the major industrial fieldbus modules are available. The drive also support two fieldbus modules at a time, so can control via a traditional industrial fieldbus, but data gather via an Ethernet based protocol
- Remote monitoring modules can be employed to monitor the drive over the web
- The safety module occupies a separate dedicated connection point ensuring safety integrity
- The drive is operated and commissioned either from a keypad or from a PC tool. The PC tool used with ACS880 is Drive Composer
- 32 drives can be connected onto a panelbus. The panelbus can be used to communicate to many drives, either using the keypad or the composer pro tool

User interfaces for ACS880-01

Please refer to page 53 for details of the ACS880 common user interfaces.

Next generation of ABB industrial drive

ACS880 – Variants, ratings, types, voltages and prices

DTC DIRECT TORQUE CONTROL

Single drive modules

Series ACS880-04

– 0.55 to 1400 kW, (380 - 690 V)
– Highest power density from a module on the market, extremely compact power module
– Wheeled module supplied with extendable ramp
– Coated boards as standard
– Speed controlled redundant fan cooling arrangement
– TÜV approved safe torque-off (STO) to SIL 3 PL e standard
– Plastic IP20 shrouds supplied which can be substituted for a pair of IP20 cabling panels which allow the module to be removed from the cabinet without disturbing customer wiring
– Brake chopper optional
– Wide range of cabinet installation options, including instructions for Rittal cabinet installation
– EMC filter for C3 category according to EN 61800-3 (2004)
– Optional Common mode filter
– Optional fieldbus modules, safety module, I/D expansion

For more information – see Technical catalogue 3AUA0000115038

The following table details the R10 and R11 frames (pictured above).
If you require information on the higher power modules (D8T and R8i), please contact ABB.

380 to 415 V, 3-phase supply voltage. The power ratings are valid at nominal voltage (400 V)

No-overload (nominal) use		Light-duty use		Heavy-duty use		Max output	Frame	Fuse	Heat dissipation	Cooling requirements	Type (+H381 +J410 +E210 +E208 +R700 for cable panels, keypad kit, EMC, CMF filter and manuals)	Price
P_N kW	I_N A	P_{Ld} kW	I_{Ld} A	P_{hd} kW	I_{hd} A	A		A † Type aR	W	m^3/h		
250	505	250	485	200	361	560	R10	800	5602	1200	ACS880-04-505A-3	£14,293
315	585	315	575	250	429	680	R10	1000	6409	1200	ACS880-04-585A-3	£17,041
355	650	355	634	250	477	730	R10	1000	8122	1200	ACS880-04-650A-3	£19,154
400	725	400	715	315	566	850	R11	1250	8764	1200	ACS880-04-725A-3	£21,122
450	820	450	810	355	625	1020	R11	1600	9862	1200	ACS880-04-820A-3	£22,688
500	880	500	865	400	725	1100	R11	1600	10578	1420	ACS880-04-880A-3	£24,253

† For fuse selection refer to the hardware manual, weak networks may require a different rating
Price shown is complete with Keypad door mounting kit, cabling panels, EMC filter, CMF filter and manuals
Note: Currents match IE3 motor ratings

The ACS880-04 can be supplied in two major variant styles. The standard variant comes complete with IP20 shrouds (plastic) a telescopic ramp, separate control unit and keypad. The customer cabling is taken directly to the module and would need to be disconnected to allow module removal.

The second variant comes complete with cable panels which fit inside the cabinet. The customer cabling is attached to these panels, which allows the module to be removed without disconnecting the customer cabling, In both cases the module is withdrawn down the ramp which is provided.

There is a wide range of other control card and keypad mounting options to allow the unit to integrate into a cabinet. The manual gives extensive instructions for Rittal cabinet installation, including a list of Rittal parts required.

Next generation of ABB industrial drive

ACS880-04 – Dimensions and options

Drive dimensions and weights drives modules

Basic Module DImensions (no shrouds or panels)					
Frame size	Height (H1) (mm)	Height no pedestal (H2) (mm)	Width (W1) (mm)	Depth (mm)	Weight (kg)
R10	1462	1337	305	505	161
R11	1662	1537	305	505	199

Module dimensions including the Cable Panels +H381					
Frame size	Height (H3) (mm)	Height no pedestal (H4) (mm)	Width (W2) (mm)	Depth (mm)	Weight (kg)
R10	1590	1465	329	505	161
R11	1741	1616	329	505	199

Options for ACS880-04

ACS880-04 is a cabinet mounted drive, so the options are designed to complement cabinet installation:

- Cabling is arranged to come in at the top and motor out at the bottom
- Standard offering comes with plastic IP20 shrouds for input and output, and motor terminals are supplied with “full sized” terminals allowing for parallel motor cables. The standard configuration is also supplied with a separate control unit and keypad
- Option +H370 requests “full sized” terminals on the input power connections allowing for parallel mains cables
- Option +H381 request full cable panels, which bolt onto the side of the module and onto the side of the cabinet wall (Replaces the standard IP20 shrouds and fixed full size cable terminals)
- Option +H356 request DC terminals
- Option +P905 request the control unit to be fitted to the power module
- Option +J414 integrates the control panel onto the front of the power module
- Option +J410 includes a keypad door mounting kit with the module
- EMC filters and common mode filters can be included
- Shrouds, keypads and wheeled pedestal can be removed if required

All next generation ABB industrial drives use the same common options and user interfaces. These are detailed on page 53.

- The drive has three slots for I/O and fieldbus expansion and one drive-to-drive serial communication link
- I/O modules can be chosen from analogue expansion, digital expansion, encoder and resolver feedback options
- Fieldbus modules can be connected to any slot and all of the major industrial fieldbus modules are available. The drive also support two fieldbus modules at a time, so can control via a traditional industrial fieldbus, but data gather via an ethernet based protocol
- Remote monitoring modules can also be employed to monitor the drive over the internet
- The safety module occupies a separate dedicated connection point ensuring safety integrity
- The drive is operated and commissioned either from a keypad or from a PC tool. The PC tool used with ACS880 is Drive Composer
- 32 drives can be connected onto a panelbus. The panelbus can be used to communicate to many drives using the keypad or the Composer Pro PC tool

User interfaces for ACS880-04

The ACS880-04 can be supplied with a keypad door mounting arrangement, which requires a single rectangular hole for the cabinet door.

Please refer to page 53 for details of the other ACS880 common user interfaces

Next generation of ABB industrial drive

ACS880 – Variants, ratings, types, voltages and prices

DTC DIRECT TORQUE CONTROL

Cabinet-built single drive

Series ACS880-07

- 45 kW - 2,800 kW, (380 - 690 V)
- IP21 as standard, IP42 and IP54 as options
- 250 kW based on a single module including rectifier and inverter
- Coated boards as standard
- TÜV approved safe torque-off (STO) to SIL 3 PL e standard
- TÜV approved emergency stopping options
- Extremely compact, internal swinging gate for control options minimises cabinet size, but ensures easy access
- Internal customer wiring is redesigned to give easier access, with pluggable connectors included
- Drive module can be extracted using a set of maintenance rails
- Factory-built cabinet with EMC and thermally type-tested for trouble-free operation
- Extensive range of standard options, that are increased to incorporate the most popular engineered options ordered with the ACS800 range
- Optional UK cable option for SWA cables
- Optional motor thermistor and PTC connections
- Internal fieldbus options
- Optional safety module
- Optional I/O modules
- ACS880 user interfaces described later

For further information, see Technical Catalogue 3AUA0000098111

380 to 415 V, 3-phase supply voltage. The power ratings are valid at nominal voltage (400 V)

No-overload (nominal) use		Light-duty use		Heavy-duty use		Max output	Frame	Fuse	Heat dissipation	Cooling requirements	Type	Price
P_N kW	I_N A	P_{Ld} kW	I_{Ld} A	P_{hd} kW	I_{hd} A	A		A † Type aR	W	m³/h		
55	105	55	100	45	87	148	R6	160	1795	435	ACS880-07-0105A-3	ABB panels can be ordered with a wide range of standard options. Price on application once the ACS880 is launched
75	145	75	138	55	105	178	R6	250	1940	435	ACS880-07-0145A-3	
90	169	90	161	75	145	247	R7	250	2440	450	ACS880-07-0169A-3	
110	206	110	196	90	169	287	R7	315	2810	450	ACS880-07-0206A-3	
132	246	132	234	110	206	350	R8	400	3800	550	ACS880-07-0246A-3	
160	293	160	278	132	246*	418	R8	500	4400	550	ACS880-07-0293A-3	
200	363	200	345	160	293	498	R9	630	5300	1150	ACS880-07-0363A-3	
250	430	250	428	200	363**	545	R9	700	6500	1150	ACS880-07-0430A-3	

*130% overload, **125% overload

† For fuse selection, refer to the hardware manual

ABB recommends the use of aR fuses for their cabinet drives, other fuses could be used if their melting curve matches ABB's recommendations

Next generation of ABB industrial drive

ACS880-07 – Dimensions and options

Dimensions and weights, cabinet-built drives

Frame size	Height 1 IP22/42 (mm)	Height 2 IP54 (mm)	Width (mm)	Depth (mm)	Weight (kg)
R6	2145	2315	430	673	240
R7	2145	2315	430	673	250
R8	2145	2315	430	673	265
R9	2145	2315	830	698	375

Note: these are the dimensions of the basic cabinet, dimensions will change with the addition of some options

IP21 IP54

Options for ACS880-07

ACS880-07 is a cabinet built drive, so its options fit inside the cabinet. The cabinet drive can be fitted with:

– IP21, IP42, IP54, variants (no IP55)
– Emergency stop variants, TÜV approved
– Motor thermistor relays
– Marine construction
– UL approved components
– Various types of cable markings, cabinet heaters, door furniture and lighting etc.
– Top or bottom cable entry for either motor or power cables
– UK gland plates for SWA cables
– 24 V control inside the cabinet
– Different levels of EMC compliance
– Extended warranty
– Additionally, ABB can accommodate any specialised option or feature by using its in-house application design team

ACS880-07 comes with options that are fitted to the drive module which is inside the cabinet:

– The drive module has three slots for I/O and fieldbus expansion and one drive-to-drive serial communication link.
– I/O modules can be chosen from analogue expansion, digital expansion, encoder and resolver feedback options
– Fieldbus modules can be connected to any slot and all of the major industrial fieldbus modules are available. The drive also supports two fieldbus modules at a time, so can control, via a traditional industrial fieldbus, but data gathers via an Ethernet-based protocol
– Remote monitoring modules can be employed to monitor the drive over the internet
– The safety module occupies a separate dedicated connection point ensuring safety integrity
– The drive is operated and commissioned either from a keypad or from a PC tool. The PC tool used with ACS880 is Drive Composer
– 32 drives can be connected onto a panelbus. The panelbus can be used to communicate to many drives, either using the keypad or the composer pro tool

User interfaces for ACS880-07

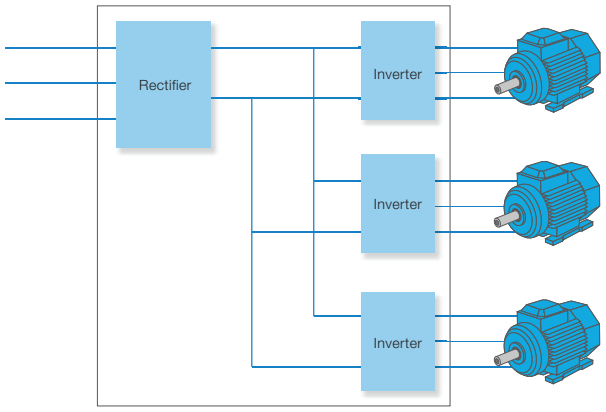
Please refer to page 53 for details of the ACS880 common user interfaces

Next generation of ABB industrial drive

ABB multidrive

A multidrive is a custom-made system to suit a larger application or a process line. The system contains multiple inverter stages of differing size, supplied from a common DC bus.

ABB can provide a ready-made cabinet, or it can provide system integrators with a comprehensive range of power modules and mechanical kits to build bespoke cabinets for end clients.



Series ACS880 multidrive cabinets

- 1.5 kW - 5600 kW
- IP21 as standard IP42 as option
- High packing density with 16 inverter units (up to frame size R2i) can be installed into one 1000 mm cabinet
- Diode bridge that is highly reliable with high power density
- Fast connectors for motor cables in the bottom part of the cabinet making installation easy
- Integrated safety including safe torque-off (STO) as standard with several safety functions as options
- Coated boards as standard
- Braking options
- DC fuse disconnectors, DC fuses or DC fuse switch including charging circuit for inverters
- Cabinet light and heater options
- Highly efficient thermal handling as heat loss of each inverter unit is guided to the back of the cabinet. All cabinets are their own separate compartment
- Long lifetime capacitors and high efficiency cooling fan with speed or on-off control
- TÜV approved emergency stops
- ACS880 user interfaces described later

For further information, see Technical Catalogue 3AUA0000115037

Series ACS880 multidrive modules

- 1.5 kW - 2200 kW
- A range of IP20 modules and IP00 kits to generate bespoke multidrive systems built into system integrators own panels
- Modules have no rectifiers, they are inverters only and range in frames from R2i to R8i (i=inverter only)
- Inverter modules contain internal pre-charge circuits making them easier to integrate
- Inverter modules are extremely compact, making cabinet line-ups extremely compact and competitive
- Selection of rectifiers available to generate DC link for the system. Active IGBT rectifiers and diode modules are available
- New style diode module (DxD) only contains diodes, making it more competitively priced and more reliable
- Cabinet kits ensure easy integration
- Integrated safety including safe torque-off (STO) as standard with several safety functions as options using the new safety module
- Coated boards as standard

- ACS880 user interfaces described later

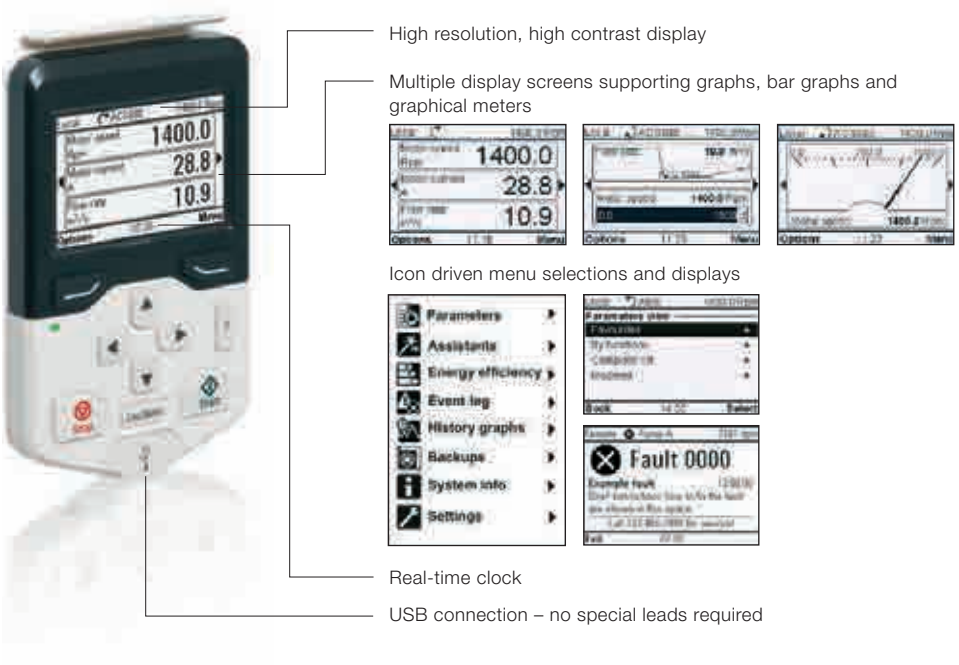
For further information, see Technical Catalogue 3AUA0000115038

Next generation of ABB industrial drive

ACS880 – Common user interfaces

New control panel

State-of-the-art high resolution keypad brings a new level of usability to the drives marketplace. The keypad is designed by industrial designers to ensure maximum usability and intuitive use. The keypad display is extremely high definition and is visible in any control room. Innovative views, transitions and screen will be very familiar to users of smartphone technology. The display supports graphics and icons to help the user navigate. The keypad also supports text editing to allow users to re-name fault messages to match plant specific actions. Customer specific start-up images and parameter favourite make the keypad easily tailorable to customers and OEMs alike.



Removable memory unit

The memory unit stores the complete parameter and firmware set for the drive. Should a drive need to be replaced, swapping the memory unit to the new drive will transfer a complete drive set-up – absolutely no recommissioning is required. This reduces down time in the event of a problem.

Fieldbus

The ACS880 supports an extensive list of fieldbus modules for connectivity to industrial networks. These modules are common with other drives within the ABB drives range.

Expansion for analogue and digital I/O

Additional I/O can be added to the ACS880. This I/O can be addressed by the fieldbus so that the ACS880 can be used as an I/O “nest”, or the I/O can be used to simply allow more connectability from the process to the drive, for example, flow or level transducers.

Safety module, FSO-11

SIL3 rated TÜV approved safety module fits within the drive, to offer drive specific safety functions. Safely Limited Speed (SLS), Safe Maximum Speed (SMS), Safe Stop Emergency (SSE), Safe Stop 1 (SS1) / stop category 1 and Safe Brake Control (SBC) can be realised with no encoder feedback required (patent pending).

Drive Composer PC tool

Drive Composer is the new PC tool for the ACS880 family. The PC tools come in two variants – the “entry” level is a free of charge point-to-point tool and allows simple parameter editing and storage, as well as monitoring and commissioning support, while the “Pro” level has all of this as well as animated control diagrams and extended commissioning, monitoring and diagnostic support, as well as the ability to program the safety functions. The Pro tool also allows the user to connect to multiple drives either over “panelbus” where the keypad port is used, or over Ethernet.

Next generation of ABB industrial drive

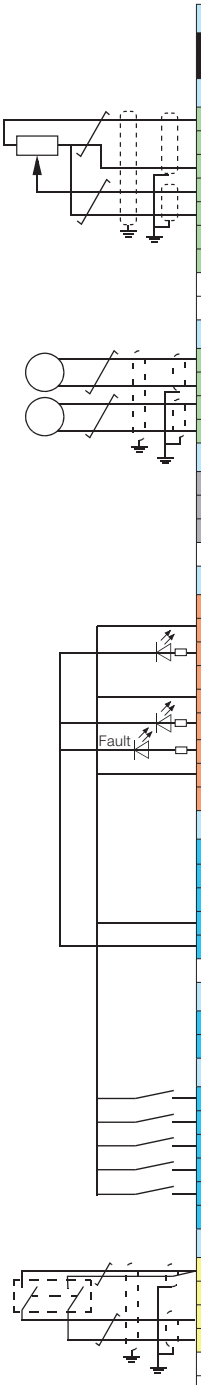
ACS880 – Common user interfaces

Typical I/O and control connections

The ABB industrial drive family uses the same control card, keypad and software structure throughout its entire range. All I/Os are fully configurable to be whatever function is required. The diagram shows a typical I/O connection.

The ACS880 uses macros to configure its I/O. The macros pre-define the I/O functionality to comply with popular industrial configurations. It is also possible to configure the I/O manually to any function required.

The ACS880 control card showing the colour coded terminal strips



XPOW	**External power input**	
1	+24VI	24 V DC, 2 A
2	GND	
XAI	**Reference voltage and analogue inputs**	
1	+VREF	10 V DC, R_L 1 to 10 kohm
2	-VREF	-10 V DC, R_L 1 to 10 kohm
3	AGND	Ground
4	AI1+	**Speed reference**
5	AI1-	0(2) to 10 V, R_{in} > 200 kohm
6	AI2+	By default not in use.
7	AI2-	0(4) to 20 mA, R_{in} > 100 ohm
J1	J1	AI1 current/voltage selection jumper
J2	J2	AI2 current/voltage selection jumper
XAO	**Analogue outputs**	
1	AO1	**Motor speed rpm** 0 to 20 mA, R_L < 500 ohm
2	AGND	
3	AO2	**Motor current** 0 to 20 mA, R_L < 500 ohm
4	AGND	
XD2D	**Drive-to-drive link**	
1	B	Drive-to-drive link or built-in Modbus
2	A	
3	BGND	
J3	J3	Drive-to-drive link termination switch
XRO1, XRO2, XRO3 Relay outputs		
1	NC	**Ready** 250 V AC/30 V DC 2 A
2	COM	
3	NO	
1	NC	**Running** 250 V AC/30 V DC 2 A
2	COM	
3	NO	
1	NC	**Faulted (-1)** 250 V AC/30 V DC 2 A
2	COM	
3	NO	
XD24	**Digital interlock**	
1	DIIL	By default not in use
2	+24VD	+24 V DC 200 mA
3	DICOM	Digital input ground
4	+24VD	+24 V DC 200 mA
5	DIOGND	Digital input/output ground
J6	Ground selection switch	
XDIO	**Digital input/outputs**	
1	DIO1	Output: Ready
2	DIO2	Output: Running
XDI	**Digital inputs**	
1	DI1	Stop (0)/Start (1)
2	DI2	Forward (0)/Reverse (1)
3	DI3	Reset
4	DI4	Acceleration and deceleration select
5	DI5	Constant speed 1 (1=On)
6	DI6	By default not in use
XSTO	**Safe torque-off**	
1	OUT1	Safe torque-off. Both circuits must be closed for the drive to start.
2	SGND	
3	IN1	
4	IN2	
X12	Safety functions module connection	
X13	Control panel connection	
X205	Memory unit connection	

ABB motion control drive and ABB machinery drive module

ABB motion control solutions

ABB offers an extensive range of machine control solutions for diverse industrial applications such as labelling, packaging, bottling, pick and place, laser cutting/trimming, stacking, cut-to-length, flying shear, web feeders and high speed rotary wrappers.

ABB's motion control solutions include human-machine interfaces (HMIs), programmable logic controllers (PLCs) and safety technology. Solutions extend to multi-axis motion controllers, high performance servo drives, rotary servo motors and linear motors. All of which seamlessly interface to provide a complete machine control solution.

To compliment the motion and machinery products, ABB offers an extensive range of industrial servo motors and cables. Motors are stocked or can be ordered with a wide range of options to suite application needs or DC retrofitting.

For technical information see Technical Catalogue 3AKA0000068580

ABB motion control drive

Series ACSM1

– For demanding machinery applications
– One drive for all motor types
– For synchronous and induction motors
– Adaptable design with modular, compact hardware
– Memory unit for easy drive management and re-commissioning
– Wide range of feedback interfaces
– Solution programming to extend drive functions, DriveStudio (IEC 61131 compatible)
– Modular and compact design, includes the functionality needed for the application
– Safe torque-off (SIL3 rated), TÜV approved

For more details, please refer to Technical Catalogue 3AFE68675073

ABB machinery drive modules

Series ACS850-04

– New higher powered module. Integral wheels and shrouding
– Optimal power frame sizes and side-by-side mounting
– Power in at top, motor out at bottom for logical cable management within the cabinet
– DC bus connection - common DC link schemes are possible
– Integrated brake chopper - choppers in each module can be used when on a DC link, to distribute braking
– DTC motor control platform
– DriveStudio and DriveSPC PC tools for customising the parameter driven drive with IEC61131 application coding and software application blocks
– Memory module contains the complete firmware, parameter and programme set-up – no re-commissioning
– STO, safe torque-off to SIL3/PL e as standard
– Modules which compliment the full range of multidrive modules

For further information see Technical Catalogue 3AUA0000041481

Medium voltage AC drives

What is a medium voltage AC drive?

ABB offers a complete range of medium voltage AC drives for speed and torque control and for the starting of large AC motors. The drives, which are built with reliable IGCT power semiconductor technology, are available as complete package solutions including transformers and motors.

Series ACS1000i

- Single drives 315 kW to 2,000 kW
- Air-cooled, 24-pulse drive with integrated input transformer
- Retrofit-ready for existing motors, suitable for most MV applications
- Integrated output sine filter for pure sinusoidal voltage and current output
- Offshore cabinet versions available

Series ACS1000

- Single drives from 315 kW to 5 MW
- Air-cooled (315 kW to 2 MW) and water-cooled (2 kW to 5 MW) versions
- Retrofit-ready for existing motors, suitable for most MV applications
- Integrated output sine filter for pure sinusoidal voltage and current output
- Offshore cabinet versions available

Series ACS2000

- Single drives from 250 kW to 2.6 MW
- Active rectifier unit or 24-pulse diode front end for minimal line side harmonics
- Regeneration and power factor correction with active rectifier
- Direct-to-line versions for operation without an input transformer
- Multilevel topology allows the use of standard motors
- Simple drive system integration
- Modular power modules for reduced MTTR
- Sine filter output optional, for retrofit and long cable run applications

Series ACS5000

- Single drives from 1.5 MW to 35 MW
- Air-cooled (1.5 MW to 6 MW) and water-cooled (4.5 MW to 35 MW) versions
- Air-cooled version with integrated input transformer (1.5 MW to 4.1 MW)
- Multilevel topology allows the use of standard motors
- Multilevel fuseless topology results in a drive with unbeatable efficiency, reliability and footprint
- Optimal network friendliness due to 36-pulse configuration

Medium voltage AC drives and low voltage DC drives

Medium voltage drives cont...

Series ACS6000

- Single or multidrives 3 MW to 27 MW
- Active rectifier unit available for 4-quadrant operation, reduced harmonics and adjustable power factor
- Line supply unit available for 2-quadrant operation and a constant power factor of 0.96 across entire speed range
- Modular design for optimum configurations, including multidrive configurations
- Offshore cabinet versions available

Series MEGADRIVE LCI

- 2 MW to 72 MW (higher power on request)
- High power with series connection of thyristors
- N+1 thyristor redundancy possible
- Fuseless design
- Water- and air-cooled converters available
- Line side harmonics: 6-pulse, 12-pulse or 24-pulse
- Motor side harmonics: 6-pulse or 12-pulse
- High converter efficiency
- Proven technology and design
- Complete package solutions including transformers, drives and motors

ABB general purpose DC drives

Series DCS550

- Range from 20 to 1000 A DC
- 230 V AC to 525 V AC
- DCS550 is a digital DC drive targeted at OEMs, such as machine builders
- Start-up assistants and commissioning wizards
- Same state of the art keypad as ACS550
- Extensive range of fieldbus interfaces
- Adaptive program for additional flexibility
- Onboard field controller

ABB industrial DC drives

Series DCS800

- From 25 to 5200 A
- Commissioning wizard gives easy start-up
- Easy to use - standard macros or user programmability
- Intuitive control panel with ‘Help’ key, consistent with many of the AC drives
- Adaptive programming for additional flexibility
- Modules can be connected in parallel up to 20,000 A
- Uses ACS800 I/O option modules and fieldbus modules
- I/O is backward compatible with DCS500 and DCS600
- Field converters built-in (up to 25 A)

Power quality filters (PQF)

Overview

– Actively eliminates harmonics in a controlled way
– Filters up to 50th harmonic in accordance with G5/4 requirements. Each harmonic individually programmable
– Redundancy feature allows units to continue when others have shut down
– Active filters - only work when harmonics are present thereby reducing unwanted losses, resulting in greater overall efficiency
– Close loop for better measurement of harmonics - thereby more accurately eliminating the potentially damaging harmonic
– Auto-detection of CT polarity - ensures accurate current distortion readings on network, resulting in easy commissioning
– Stores record trail. Fault and event log - any trip will have a record trail

Series PQFM, PQFI

– Available in IP00 back plane or IP21, IP42 cabinets
– New intuitive user interface
– Current ratings, 70 A, 100 A, 130 A, 150 A, 250 A, 450 A, per module. The modules can be connected in parallel to a maximum of eight modules of equal rating

Series PQFs

– Small compact unit suitable for wall mounting
– Low ratings available from 30 A, 45 A, 60 A, 70 A, 80 A, 90 A, 100 A. The modules can be connected in parallel to a maximum of four modules of equal rating
– Same user interface as the larger units
– Available in IP30

Remote monitoring options

Remote monitoring overview

Remote monitoring is the reporting of information back to the user, from a remote station or location. Typical remote monitoring information can include:

- Energy consumption and savings
- Motor condition
- Warnings (predictive maintenance), faults and alarms
- Diagnostics
- Monitoring actual values and parameters

– Parameter access is possible, but is not the primary function of remote monitoring

Ethernet adapter – for ABB machinery drives and ABB standard drives

Series - SREA-01

Ethernet adapter provides remote monitoring access for up to 10 drives. It connects to the drive(s) via an RS485 modbus interface. It can send process data, data logs and event messages independently, without a PLC or a dedicated on-site computer. The module can send either e-mails or SMS text messages to inform the user of the status of the drive(s) connected to it. It has an internal web server for easy configuration and drive access. Web pages can be configured with site photos and site naming.

Ethernet adapater for ABB industrial drives

Series - NETA-01, NETA-21

NETA-01 module provides remote access to nine ABB industrial drives. The module connects to the drive via a high speed optical connection that can be configured in a ring or star configuration. It can send process data, data logs and event messages independently, without a PLC or a dedicated on-site computer. The module can send either e-mails or SMS text messages to inform the user of the status of the drive(s) connected to it. It has an internal web server for easy configuration and drive access. Web pages can be configured with site naming. Full parameter access is possible.

Ethernet adapater for local communiation

Series - MOXA

MOXA module provides remote access to a single individual drive. The module connects to the drive via an RS232 connection to the keypad/panel port of the drive. It is a low cost point-to-point remote monitoring device. MOXA is ideal as a point-to-point device over which commissioning tools can be connected to the drive from a remote location, so diagnosis of faults and problems are possible.

High speed drive monitoring – remote diagnotics

Series – DriveMonitor

DriveMonitor is a service tool which can be fitted to any ABB industrial drive in case of site problems and issues. It uses high speed optical connections to the drives power stages and monitors all of the switching signals sent. In this way complicated system problems can be diagnosed. DriveMonitor can also be used as a system optimisation and recording tool, as its memory buffers can save up to one years worth of performance data.

Monitor drives on existing networks

Series – DriveBrowser PC tool

DriveBrowser allows a user to monitor any ABB drive connected to an existing Ethernet network, without having to connect another “tools” chain network on the site. Connect DriveBrowser to a suitable “hub” location and view, edit and tune all of the ABB drives on the Ethernet ring.

Software tools

ABB offers several software tools to facilitate and enhance the use of ABB drives. These tools provide a user-friendly and easy-to-use approach for the selection, commissioning and use of AC drives.

Integration and programming tools

Drive Composer

The Drive Composer PC tool offers fast and harmonised set-up, commissioning and monitoring for the new ABB industrial drive portfolio. The tool has two variants, a free version called Drive Composer Entry and a professional level tool which is licensed. The free version of the tool provides start-up and maintenance programming with monitoring and parameter editing, while the professional version provides additional features such as custom parameter windows, control diagrams for easy parameter editing of the drive's configuration and the ability to programme the built-in safety module. Drive Composer will have add-ons for adaptive programming and CoDeSys programming for more complicated system designs.

DriveAP

For adaptive programming of ABB industrial drives.

This PC tool is used to create, document, edit and download adaptive programs. Adaptive programming can be done with the standard control panel or with DriveAP.

DriveAP offers a clear and easy way to develop, test and document adaptive programmes with a PC. It modifies function blocks and their connections and requires no special programming.

DriveStudio

A user-friendly PC environment for simple drive commissioning tasks as well as more demanding drive tuning and programming tasks. DriveStudio is used with the ABB machinery drive and ABB motion control drives and water and wastewater drives. Drive Studio contains:

Commissioning and tuning
- Drive overview screen
- Parameter setting and signal monitoring
- Data logger and on-line signal monitoring for tuning

Solution programme composer
- Function block programming with standard function block library
- Professional programming environment: hierarchy levels, custom circuits, user parameters, copy protection etc.

DriveCAM tool
Multiple methods for designing axis profile between reference axis and controlled drive axis

Start-up and maintenance tools

DriveWindow

A Windows application used for commissioning and maintenance. Functions include local control, monitoring, parameter edits, fault logging, trending, backup and restore

- Shows actual status of the connected drive
- Edit and show the drive parameters
- Save and load drive parameters
- Backup and restore drive parameters
- Offline configuration of drive parameters
- Read fault loggers and diagnostic data

Used with ABB industrial drives equipped with high-speed fibre optic communication, or remotely via the Internet.

DriveWindow Light

Available for ABB general purpose drives and ABB machinery drives, has the same functions as DriveWindow but is designed for point-to-point communication, via control panel port.

DriveConfig

Dedicated programming tool for the ABB micro drive. Allows access to the extended parameter set of ACS55 and allows un-powered programming.

Drive Analyser

New PC tool to allow long term analysis of performance and diagnostics. Data can be collected for up to one year.

To download software tools, go to:
www.abb.com > drives > drive PC tools.

Software tools

Engineering tools

DriveSize

For dimensioning drives and motors. This PC programme helps select an optimal motor, drive and transformer, which is especially useful where a straightforward selection from a catalogue is not possible. DriveSize is used to compute network harmonics and to create documents about dimensioning. It contains current versions of ABB's motor and drive catalogues.

It can also be used in conjunction with ABB machinery drives to specify the dimensions of different kinds of linear or rotary movement mechanisms such as lead screws, rack and pinion combinations, belts and pulleys, conveyors, feed rolls and rotating tables.

DriveSize software can be used in Win98, WinNT, Win2000 and WinXP and Windows 7 operating systems.

DriveChopper

For dimensioning a braking chopper and resistor.

DriveChopper is a web tool for braking chopper and resistor dimensioning. The programme is created especially for system designers who need a braking unit for a particular drive application.

DriveUpgrade

For finding an adequate drive to replace an old one. This on-line tool is ideal for finding a replacement to an existing ABB drive that may be coming to the end of its useful life. Simply input some basic information and the modern equivalent drive will be revealed.

To download, go to: www.abb.com > drives > drive PC tools.

Energy saving tools

For comparison of energy consumption between different flow control methods in pumps and fans, ABB has developed calculation tools for estimating the energy savings that become available when applying electric speed control to certain flow machines.

PumpSave

For comparing AC drive control against throttling, on/off and hydraulic coupling control in pumps. Calculate how much energy and money you could be saving with ABB drives while also deriving other benefits such as soft starting and stopping, an improved power factor and connection into process automation. PumpSave also carries out a simple dimensioning and recommends an appropriate ABB drive type. Medium voltage drives now included.

FanSave

For comparing AC drive control against traditional flow control methods in fans. Calculate the savings you can achieve by replacing outlet damper, inlet vane or pitch control methods with electronic speed control from an ABB drive. FanSave also provides financial and environmental figures concerning the control method retrofit project and recommends a suitable ABB drive type.

The ABB Energy Calculator App

The App allows users to calculate the energy savings you can achieve on a typical pump or fan load by replacing direct-on-line control with a variable-speed drive. Simply select your industry and the operating duty profile, the voltage, phase and motor power rating, running hours and electricity cost. The App then estimates how much CO_2, energy and money you can save by installing an ABB drive to control the application.

To download the ABB Energy Calculator App, visit the Apple APP store.

To download a series of energy saving tools go to:
www.abb.co.uk/energy

Drives life cycle services

Service options for variable-speed drives

A proactive drives maintenance programme keeps you competitive by minimising disruption to your production.

The many drives used in industry have a high degree of reliance placed upon them. Although drives are not normally the most expensive pieces of capital equipment, they often perform critical duties and have a high in-service value. A drive failure can result in loss of production and revenues, as well as having safety and environmental consequences. To reduce the risk and consequences of failure, the drive must be properly maintained at the right times in its lifecycle.

ABB provides customised and standard levels of service for drives support. The service levels mean your exact operational and financial needs can be met, maximising the reliability of your plant over its entire lifecycle. Service elements can be combined into a service contract, help with planning and budgeting.

Life cycle services

The services offered by ABB span the entire value chain, from the moment a customer makes the first enquiry to disposal and recycling of the drive. Thro ughout the value chain, ABB provides training, technical support and customised contracts. All of this is supported by one of the most extensive global drive sales and service networks.

Pre-purchase

ABB provides a range of services that help guide the customers to the right products for their applications.

Order and delivery

Orders can be placed directly to ABB or through ABB's channel partners. ABB's sales and service network offers timely deliveries including express delivery.

Installation and commissioning

While many customers have the resource to undertake installation and commissioning on their own, ABB and its channel partners offer professional installation and start-up services.

Operation and maintenance

Through remote monitoring, ABB can guide the customer through a fast and efficient fault-finding procedure as well as analyse the operation of the drive and the customer's process. From site surveys to preventive maintenance and reconditioning of drives, ABB has all the options covered to keep its customers' processes operational.

Upgrade and retrofit

An existing ABB drive can often be upgraded to the latest software or hardware to improve the performance of the application. Existing processes can be economically modernised by retrofitting the latest drive technology to cooling fans, removing the need for mechanical control equipment, such as inlet guide vanes or dampers and improving efficiency through energy savings.

Replacement and recycling

ABB can advise on the best replacement drive while ensuring that the existing drive is disposed of in a way that meets all local environmental regulations.

Entire value chain services

The main services available throughout the entire value chain include:

– Training and learning - ABB offers product and application training
– Technical support - At each stage of the value chain, an ABB expert is available to offer advice to keep the customer's process or plant operational.
– Contracts - Customised contracts can be devised between the customer and ABB.

The full portfolio of life cycle services are described in a separate brochure that is available on request – please call 07002 SERVICE (07002 7378423) for a copy.

Drives Advantage

ABB's certified partners provide Drives Advantage: a series or services targeting the current range of products up to 400 kW. Services include:

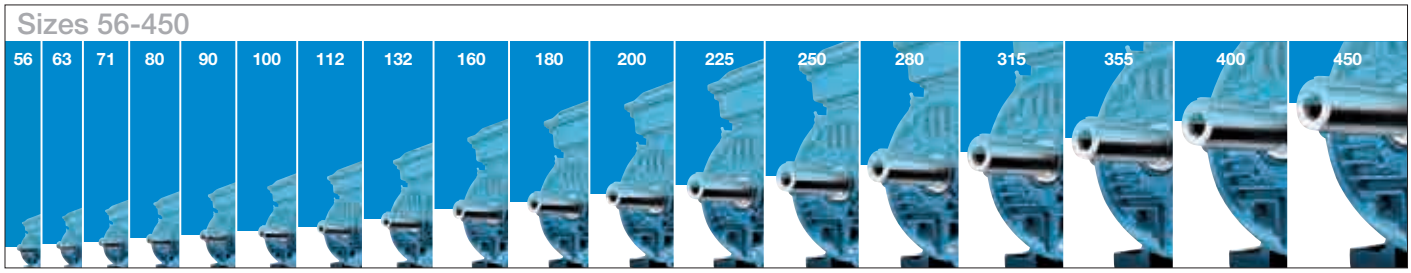
– installation
– start-up assistance
– upgrades
– hire services
– planned maintenance
– repairs
– energy surveys
– training

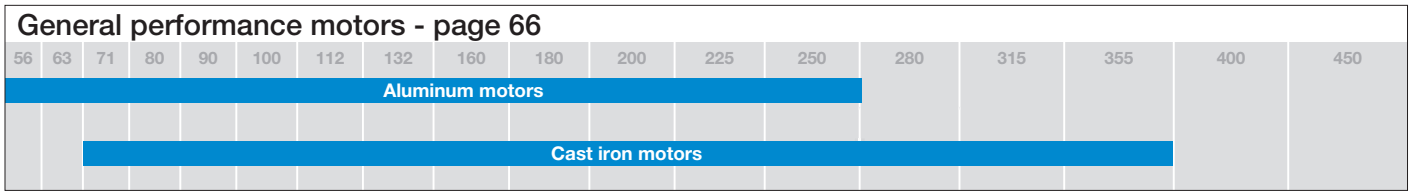
The full portfolio of Drives Advantage services are described in a separate brochure that is available on request – please call 07000 DRIVES (07000 374837) for a copy.

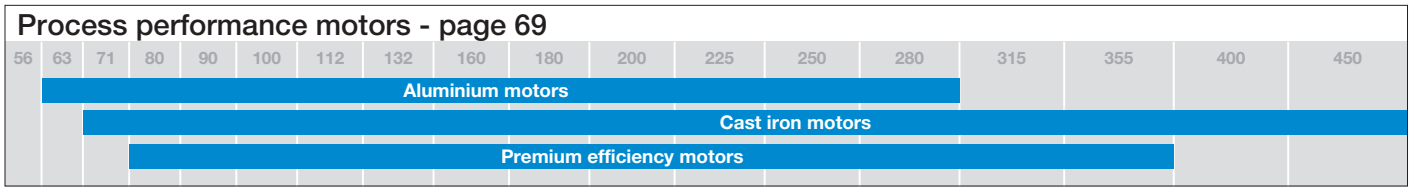
ABB University - Professional drives training

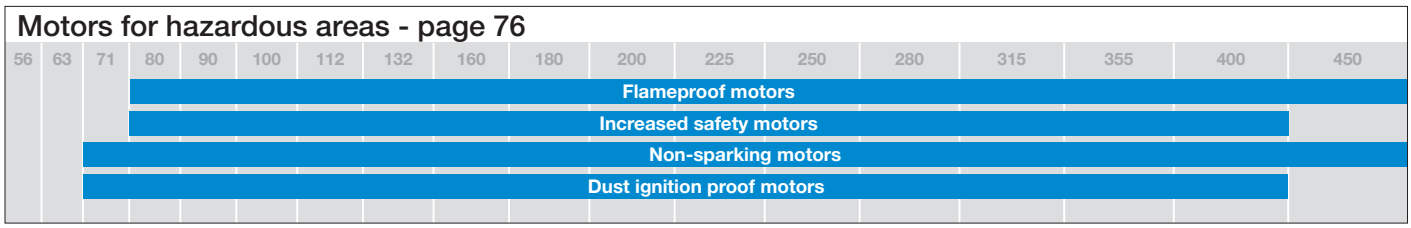
Factory certified courses delivered in a bespoke drives training facility by experienced applications and service personnel. With ABB University you can enrol onto either e-learning or classroom based courses. Please call **01785 285939** or visit **www.abb.co.uk/abbuniversity**

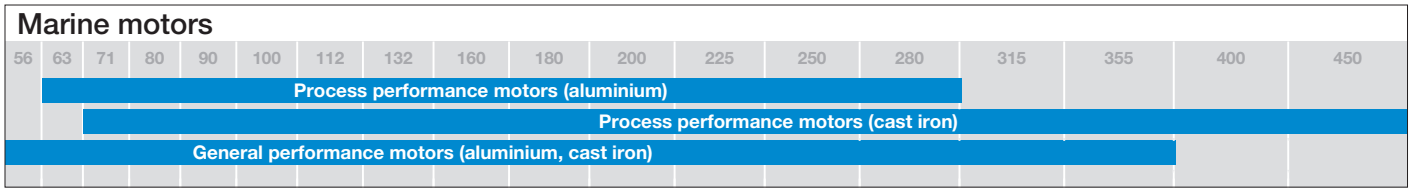
ABB low voltage AC motors

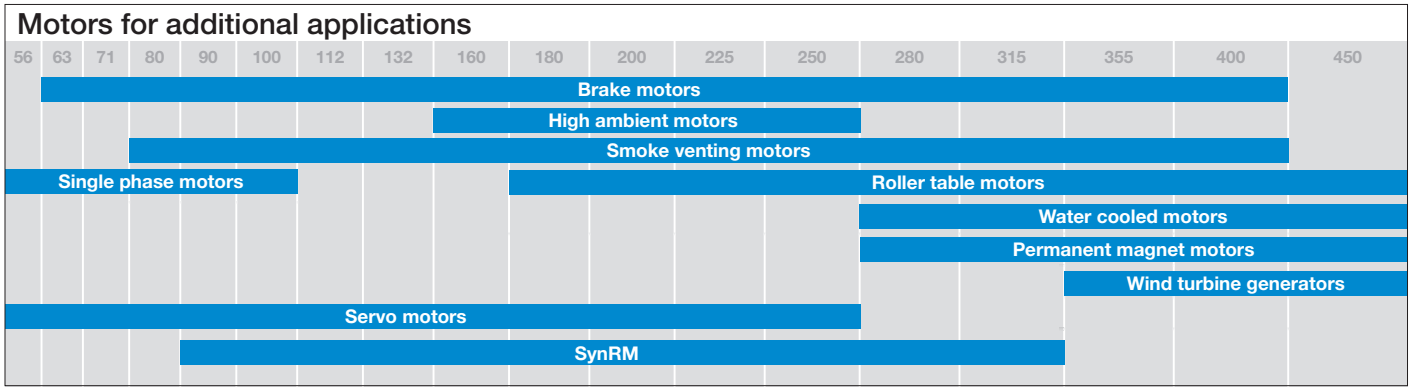



General performance motors - page 66
56 63 71 80 90 100 112 132 160 180 200 225 250 280 315 355 400 450
Aluminum motors
Cast iron motors


Process performance motors - page 69
56 63 71 80 90 100 112 132 160 180 200 225 250 280 315 355 400 450
Aluminium motors
Cast iron motors
Premium efficiency motors


Motors for hazardous areas - page 76
56 63 71 80 90 100 112 132 160 180 200 225 250 280 315 355 400 450
Flameproof motors
Increased safety motors
Non-sparking motors
Dust ignition proof motors


Marine motors
56 63 71 80 90 100 112 132 160 180 200 225 250 280 315 355 400 450
Process performance motors (aluminium)
Process performance motors (cast iron)
General performance motors (aluminium, cast iron)


Motors for additional applications
56 63 71 80 90 100 112 132 160 180 200 225 250 280 315 355 400 450
Brake motors
High ambient motors
Smoke venting motors
Single phase motors
Roller table motors
Water cooled motors
Permanent magnet motors
Wind turbine generators
Servo motors
SynRM

For more information call 07000 MOTORS (07000 668677)

European MEPS for low voltage motors

Urgent action needed before 1st January 2015 - see Phase 2 below

2014
Regulation EU 4/2014 introduced

2009
EuP Directive 2005/32/EC Eco-design formally adopted EC 640/2009

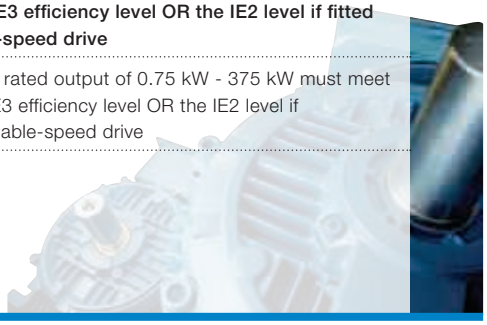
Mandatory EuP Directive

Applies to motors:
– rated voltage up to 1000 V
– single-speed, three-phase, 50 Hz
– 2, 4 and 6-pole
– rated output from 0.75 kW to 375 kW
– S1 Duty

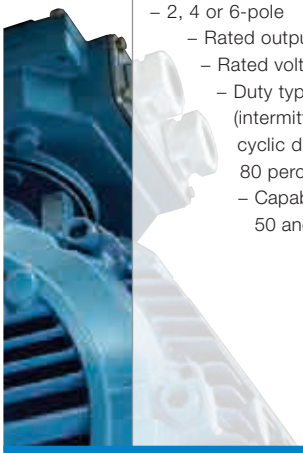
Does not apply to motors designed to operate exclusively:
– in potentially explosive atmospheres as defined in ATEX directive 94/9/EC
– brake motors
– ambient air temperature outside the range -30°C to +60°C
– altitudes exceeding 4000m asl
– maximum operating air temperature above 400°C

Implementation timetable

Phase 1 From 16 June, 2012	Motors must meet the IE2 efficiency level
Phase 2 From 1 January, 2015	**Motors with a rated output of 7.5 kW - 375 kW must meet EITHER the IE3 efficiency level OR the IE2 level if fitted with variable-speed drive**
Phase 3 From 1 January, 2017	Motors with a rated output of 0.75 kW - 375 kW must meet EITHER the IE3 efficiency level OR the IE2 level if fitted with variable-speed drive



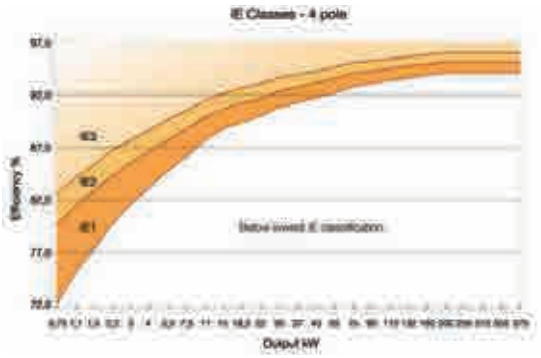
2008
IEC 60034-30



Standard for LV motor efficiency classes

Motors covered by standard include:
– Single-speed, three-phase, 50 and 60 Hz
– 2, 4 or 6-pole
– Rated output from 0.75 kW to 375 kW
– Rated voltage U_N up to 1000 V
– Duty type S1 (continuous duty) or S3 (intermittent periodic duty) with a rated cyclic duration factor of 80 percent or higher
– Capable of operating direct online 50 and 60 Hz

Super premium efficiency	IE4	Not yet defined
Premium efficiency	IE3	Premium
High efficiency	IE2	Comparable to Eff1
Standard efficiency	IE1	Comparable to Eff2



2007
IEC 60034-2-1

Standard on efficiency measurement methods

Introduces new rules concerning the testing methods to be used for determining losses and efficiency.

The resulting efficiency values differ from those obtained under the previous IEC testing standard IEC 60034-2: 1996

ABB calculates efficiency values according to the indirect method, with additional losses determined from measurement. This is the preferred low uncertainty method outlined in the standard.

For more information call 07000 MOTORS (07000 668677)

MotorAdvantage

A scheme to determine how best to save money, reduce energy use and lower maintenance costs from a plant's installed electric motor base.

MotorAdvantage aims to encourage industry to uncover the true cost of running electric motors. Research by ABB reveals that UK industry is failing to efficiently manage its motor inventory, thereby incurring millions of pounds of unnecessary downtime, repair and energy costs.

MotorAdvantage is aimed at companies operating a continuous process such as those found in food & beverage, chemical, oil & gas and pharmaceuticals. Such processes tend to have critical applications, whereby if a motor fails the cost to a company can be hundreds of pounds per hour in lost revenue. It is not just the loss of production but the potential loss of the company's customer.

How it works

There are three stages to MotorAdvantage:

1. Consultation

During the consultation process ABB examines the installed motor asset register for the plant and, working with the local engineers, identifies up to five critical applications that are running either continuously or for more than 4,000 hours per annum. They then determine some basic information about these motors such as:

- How old are the installed motors?
- How efficient are the installed motors?
- How many hours do they run per annum?
- Have they been rewound before?
- What spares holding do you have for critical plant?
- What is your repair/rewind policy for 'failed' motors?

ABB also engages with the plant's process engineers to determine the exact design criteria for the various processes. This gives ABB a clearer understanding of how the process is meant to operate and its critical design operating points, thereby ensuring that a properly dimensioned motor is selected should a replacement be deemed necessary.

2. The Appraisal

An ABB engineer, or one of ABB's authorised channel partners, visits the end-user to inspect the selected motors, get an understanding of the plant, the inventory of spare motors, energy and maintenance plans. It is not unusual to find that an old motor can be 1-5 percent lower in efficiency compared to a new premium efficiency variant. If that motor is running continuously then you can achieve a typical payback of between two to three years should you wish to take the decision to scrap the motor prior to failure.

If the motor is replaced at the point of failure then taking the rewind cost into the payback calculation, the new motor cost can be recovered in less than 12 months. Bear in mind that

many rewound motors will only have a six month warranty of the repaired components whilst a new premium efficiency motor from ABB will come with a full three year warranty.

3. Proving the savings – report and recommendations

Following the collection of the data, the findings are analysed and potential savings identified using dedicated software. The findings are methodically presented, with tables being created to help identify where savings are likely to arise. Among the data available includes an estimation of present energy usage; whether the application would benefit from variable-speed control; payback time if an investment is made in new motors; carbon dioxide emission reductions; along with many other key facts and analysis.

An action plan is prepared, usually comprising an Executive Summary and a detailed Engineer's Report, highlighting applications that can save the most. The figures will normally be translated into monthly savings, and there will be detailed recommendations for implementation.

Benefits

- In just half-a-day, an ABB engineer can quickly assess up to five installed motors that could benefit from a motor management plan
- Assesses the end-users current policy in the event of a motor failure and the financial impact on the company
- Identifies improvements to be made with regards to maintenance and stockholding
- Determines the energy use of the current installation
- Avoids damage to a customers brand or image caused through loss of production
- Avoids overly ambitious motor management plans that try to assess every single motor on a plant

General performance motors

What is a general performance motor?

General performance motors combine convenience and easy handling seamlessly with ABB's engineering expertise, while at the same time providing standard variants and modifications. The motors can be tailored according to the specific needs of OEMs. The high modularity enables adding a wide variety of elements to the robust frame, thus making the overall solution to fit the specific situation and customer need perfectly. As the user only pays for the enhancements needed and used, the motors are free from all unnecessary elements.

Where can it be used?

- End-users in industry
- Tailored serial project OEM's
- Pumps
- Fans
- Compressors

Highlights

- Variant codes from production which OEM customers need
- One year warranty
- IE2 efficiency
- 2, 4 & 6 pole designs

General performance cast iron motors, 71-355, 2, 4 & 6 poles

IE2

TEFC low voltage motors, cast iron, IP 55, IC 411, single-speed. 400 V 3-phase 50 Hz
See product catalogues or **www.abb.com/motors&generators** for more information on products.

Output kW	Frame size		Torque Nm	Current I	Eff*	Foot price	Flange price
3000 r/min = 2 poles							
0.37	M2BA	71 MA	1.32	0.96	69.2	£150	£164
0.55	M2BA	71 MB	1.95	1.27	73.2	£154	£173
0.75	M2BA	80 MB	2.4	1.81	80.6	£204	£222
1.1	M2BA	80 MC	3.6	2.4	81.8	£258	£296
1.5	M2BA	90 SLB	4.9	3	82.2	£306	£346
2.2	M2BA	90 SLC	7.2	4.3	84.7	£379	£418
3	M2BA	100 LB	9.7	5.9	85.2	£461	£512
4	M2BA	112 MB	13.1	7.7	86.1	£545	£598
5.5	M2BA	132 SMB	18.3	10.4	88.0	£714	£782
7.5	M2BA	132 SMC	24.7	14.5	88.6	£906	£977
11	M2BA	160 MLA	35.9	19.8	89.8	£962	£1,053
15	M2BA	160 MLB	48.8	26.4	91.1	£1,225	£1,313
18.5	M2BA	160 MLC	60.2	32.9	91.0	£1,456	£1,544
22	M2BA	180 MLA	71.6	38.1	91.5	£1,732	£1,868
30	M2BA	200 MLA	97.1	52.7	92.2	£2,361	£2,544
37	M2BA	200 MLB	119	63.4	92.5	£2,911	£3,094
45	M2BA	225 SMA	145	77.6	93.0	£3,410	£3,622
55	M2BA	250 SM	177	93.9	93.9	£4,167	£4,410
75	M2BA	280 SMA	240	130	94.0	£6,608	£6,965
90	M2BA	280 SMB	288	153	94.3	£7,947	£8,304
110	M2BA	315 SMA	352	195	94.6	£9,679	£10,286
132	M2BA	315 SMB	422	228	94.9	£11,697	£12,304
160	M2BA	315 SMC	512	272	95.2	£14,518	£15,125
200	M2BA	315 MLA	640	336	95.3	£18,215	£18,822
250	M2BA	355 SMA	800	424	95.4	£23,072	£24,143
315	M2BA	355SMB	1009	535	95.4	£28,929	£30,000
355	M2BA	355SMC	1136	609	95.5	£32,679	£33,750

Output kW	Frame size		Torque Nm	Current I	Eff*	Foot price	Flange price
1500 r/min = 4 poles							
0.25	M2BA	71 MA	1.74	0.65	68.3	£139	£157
0.37	M2BA	71 MB	2.5	0.88	72.4	£147	£176
0.55	M2BA	80 MA	3.7	1.45	74.5	£176	£204
0.75	M2BA	80 MD	5	1.83	81.0	£252	£277
1.1	M2BA	90 SLB	7.3	2.3	83.6	£316	£349
1.5	M2BA	90 SLD	10	3	84.3	£379	£412
2.2	M2BA	100 LC	14.4	4.7	85.9	£430	£479
3	M2BA	100 LD	19.7	6.3	86.8	£482	£531
4	M2BA	112 MB	26.5	8.2	86.8	£575	£628
5.5	M2BA	132 SMB	35.9	11.1	89.0	£736	£803
7.5	M2BA	132 SMC	49.3	14.9	89.3	£945	£1,015
11	M2BA	160 MLA	71.7	20.7	90.2	£995	£1,083
15	M2BA	160 MLB	97.9	28.4	90.6	£1,268	£1,356
18.5	M2BA	180 MLA	120	34.8	91.2	£1,456	£1,593
22	M2BA	180 MLB	143	41.7	91.6	£1,732	£1,868
30	M2BA	200 MLA	194	56.5	92.3	£2,274	£2,455
37	M2BA	225 SMA	238	68.3	93.0	£2,804	£3,016
45	M2BA	225 SMB	290	83.9	93.2	£3,410	£3,622
55	M2BA	250 SMA	355	99.8	93.5	£4,167	£4,410
75	M2BA	280 SA	482	135	94.2	£6,393	£6,750
90	M2BA	280 SMB	579	160	94.4	£7,465	£7,840
110	M2BA	315 SMA	706	194	94.7	£9,268	£9,875
132	M2BA	315 SMB	847	233	95.0	£11,179	£11,786
160	M2BA	315 SMC	1027	285	95.2	£13,518	£14,125
200	M2BA	315 MLA	1285	352	95.3	£17,161	£17,768
250	M2BA	355 SMA	1604	445	95.2	£21,411	£22,465
315	M2BA	355 SMB	2021	560	95.5	£27,143	£28,215
355	M2BA	355 SMC	2279	623	95.5	£30,715	£31,786

Output kW	Frame size		Torque Nm	Current I	Eff*	Foot price	Flange price
1000 r/min = 6 poles							
0.18	M2BA	71 MA	1.9	0.57	63.7	£160	£181
0.25	M2BA	71 MB	2.6	0.77	67.2	£183	£206
0.37	M2BA	80 MA	3.8	1.09	71.0	£201	£227
0.55	M2BA	80 MB	5.7	1.51	73.9	£225	£255
0.75	M2BA	90 SLC	7.4	2.3	78.7	£236	£266
1.1	M2BA	90 SLE	11.2	3	78.2	£278	£312
1.5	M2BA	100 L	15	3.8	82.2	£348	£387
2.2	M2BA	112 MB	22.1	5.5	82.5	£469	£512
3	M2BA	132 SMB	29.3	8	85.3	£616	£659
4	M2BA	132 SMB	39.7	10	84.9	£670	£731
5.5	M2BA	132 SMF	54.4	12.9	86.1	£892	£927
7.5	M2BA	160 MLA	73.7	15.6	87.6	£1,028	£1,117

* Efficiency full load 100%

Output kW	Frame size		Torque Nm	Current I	Eff*	Foot price	Flange price
1000 r/min = 6 poles							
11	M2BA	160 MLB	108	22.6	88.7	£1,379	£1,467
15	M2BA	180 MLA	147	31.7	89.7	£1,793	£1,929
18.5	M2BA	200 MLA	181	37.2	90.7	£2,211	£2,393
22	M2BA	200 MLB	215	44.1	91.0	£2,629	£2,811
30	M2BA	225 SMA	290	56.5	92.2	£3,497	£3,710
37	M2BA	250 SMA	358	69.6	92.4	£4,205	£4,448
45	M2BA	280 SA	434	83.3	92.8	£5,840	£6,215
55	M2BA	280 SB	530	101	93.3	£7,143	£7,500
75	M2BA	315 SMA	721	142	94.0	£9,572	£10,179
90	M2BA	315 SMB	866	165	94.3	£11,500	£12,108
110	M2BA	315 SMC	1058	201	94.7	£13,983	£14,590
132	M2BA	315 MLA	1270	241	94.9	£16,697	£17,304
160	M2BA	355 SMA	1540	293	94.9	£20,643	£21,715
200	M2BA	355 SMB	1925	360	95.2	£25,893	£26,786
250	M2BA	355 SMC	2409	450	95.3	£31,786	£32,858

General performance aluminium motors, 56-250, 2, 4 & 6 poles

IE2

TEFC low voltage motors, aluminium, IP 55, IC 411, single-speed. 400 V 3-phase 50 Hz
See product catalogues or **www.abb.com/motors&generators** for more information on products.

Output kW	Frame size	Torque Nm	Current I	Eff*	Foot price	Flange price
3000 r/min = 2 poles						
0.09	M2AA 56 A	0.3	0.31	59.8	£118	£134
0.12	M2AA 56 B	0.4	0.4	67.2	£121	£138
0.18	M2AA 63 A	0.6	0.55	75.0	£130	£148
0.25	M2AA 63 B	0.84	0.66	78.6	£132	£150
0.37	M2AA 71 A	1.26	0.95	73.8	£141	£159
0.55	M2AA 71 B	1.88	1.29	78.4	£149	£167
0.75	M2AA 80 B	2.4	1.7	81.4	£198	£215
1.1	M2AA 80 C	3.6	2.4	8.6	£250	£287
1.5	M2AA 90 L	4.9	2.9	84.1	£297	£335
2.2	M2AA 90 LB	7.3	4.4	84.6	£367	£405
3	M2AA 100 LB	9.8	5.8	86.4	£447	£497
4	M2AA 112 MB	13.2	7.6	86.1	£529	£580
5.5	M2AA 132 SB	18	11	88.0	£693	£759
7.5	M2AA 132 SC	24.5	14	88.5	£879	£948
11	M2AA 160 MLA	35.9	19.8	89.8	£1,067	£1,180
15	M2AA 160 MLB	48.8	25.4	91.1	£1,321	£1,417
18.5	M2AA 160 MLC	60.2	32.9	91.0	£1,584	£1,682
22	M2AA 180 MLA	71.6	38.1	91.5	£1,872	£1,998
30	M2AA 200 MLA	97.1	52.7	92.2	£2,422	£2,568
37	M2AA 200 MLB	119	63.4	92.5	£2,974	£3,138
45	M2AA 225 SMA	145	77.6	93.0	£4,546	£4,741
55	M2AA 250 SMA	177	93.9	93.9	£5,319	£5,531

Output kW	Frame size	Torque Nm	Current I	Eff*	Foot price	Flange price
1500 r/min = 4 poles						
0.06	M2AA 56 A	0.42	0.25	51.1	£114	£129
0.09	M2AA 56 B	0.62	0.37	55.5	£117	£132
0.12	M2AA 63 A	0.81	0.46	65.5	£126	£144
0.18	M2AA 63 B	1.24	0.62	67.3	£128	£146
0.25	M2AA 71 A	1.74	0.72	65.1	£134	£152
0.37	M2AA 71 B	2.5	0.96	69.7	£142	£170
0.55	M2AA 80 A	3.8	1.41	72.8	£170	£198
0.75	M2AA 80 D	5	1.65	79.8	£244	£268
1.1	M2AA 90 LB	7.3	2.4	83.7	£306	£338
1.5	M2AA 90 D	9.9	3.3	84.2	£367	£400
2.2	M2AA 100 LC	14.4	4.6	86.4	£417	£465
3	M2AA 100 D	19.8	6.3	85.7	£467	£515
4	M2AA 112 MB	26.4	8.8	86.7	£558	£609
5.5	M2AA 132 M	35.8	11.2	89.0	£714	£779
7.5	M2AA 132 MA	49	15.3	89.1	£917	£985
11	M2AA 160 MLA	71.7	20.7	90.2	£1,076	£1,189
15	M2AA 160 MLB	97.9	28.4	90.5	£1,345	£1,430
18.5	M2AA 180 MLA	120	34.8	91.2	£1,616	£1,729
22	M2AA 180 MLB	143	41.7	91.6	£1,904	£2,002
30	M2AA 200 MLA	190	56.5	92.3	£2,373	£2,486
37	M2AA 225 SMA	238	68.3	93.0	£3,193	£3,418
45	M2AA 225 SMB	290	83.9	93.2	£3,886	£4,112
55	M2AA 250 SMA	355	99.8	93.5	£4,643	£4,835

Output kW	Frame size	Torque Nm	Current I	Eff*	Foot price	Flange price
1000 r/min = 6 poles						
0.09	M2AA 63 A	0.94	0.49	47.1	£138	£156
0.12	M2AA 63 B	1.25	0.51	57.5	£142	£161
0.18	M2AA 71 A	1.94	0.61	59.5	£155	£175
0.25	M2AA 71 B	2.6	0.79	64.0	£177	£200
0.37	M2AA 80 A	3.9	1.07	68.0	£195	£220
0.55	M2AA 80 B	5.8	1.58	68.7	£218	£247
0.75	M2AA 90 LB	7.7	1.96	77.6	£229	£258
1.1	M2AA 90 LD	11.2	3	78.2	£269	£302
1.5	M2AA 100 LC	15.1	3.6	80.3	£337	£375
2.2	M2AA 112 MB	21.9	5.3	81.9	£455	£497
3	M2AA 132 S	29.8	7.9	83.3	£598	£639
4	M2AA 132 MB	39.1	9.5	86.4	£650	£709
5.5	M2AA 132 MC	54.4	13.7	86.1	£736	£775
7.5	M2AA 160 MLA	73.7	15.6	87.6	£1,102	£1,188
11	M2AA 160 MLB	108	22.6	88.7	£1,500	£1,584
15	M2AA 180 MLA	147	31.7	89.7	£1,938	£2,066
18.5	M2AA 200 MLA	181	37.2	90.7	£2,292	£2,422
22	M2AA 200 MLB	215	44.1	91.0	£2,389	£2,535
30	M2AA 225 SMA	290	56.5	92.2	£3,951	£4,144
37	M2AA 250 SMA	358	69.6	92.4	£4,692	£4,900

* Efficiency full load 100%

Process performance cast iron motors

IE2

TEFC low voltage motors, cast iron frame, IP 55, IC 411, single-speed. 400 V 3-phase 50 Hz
See product catalogues or **www.abb.com/motors&generators** for more information on products.

What is a process performance motor?

Process performance motors are the flagship of ABB's standard low voltage motors. This range provides the most comprehensive, versatile set of motors for the process industries and heavy-duty applications which are dependent on continuous reliability, lowest possible environmental impact and life cycle costs. Their superior ability to perform reliably and efficiently, continuously and even under the most challenging circumstances, ensures that they power their way through the toughest tasks and conditions. As such they come with a three years warranty that can be extended to five years.

Where can it be used?

– End-users in continuous process industries
– Project OEMs
– EPCs
– Demanding industries:
  - pulp and paper
  - metals
  - minerals and mining

Highlights

– All variant codes possible for process industry
– Application knowledge and engineering
– With three years warranty and option to extend to five years
– IE2 efficiency, IE3 available

Process performance cast iron motors, 71-450, 2 poles IE2

TEFC low voltage motors, cast iron frame, IP 55, IC 411, single-speed. 400 V 3-phase 50 Hz
See product catalogues or **www.abb.com/motors&generators** for more information on products.

Output kW	Frame size	Torque Nm	Current I	Eff*	Foot price	Flange price	
3000 r/min = 2 poles							
0.37	M3BP 71 MA	1.27	0.96	69.2	£242	£277	
0.55	M3BP 71 MB	1.86	1.27	73.2	£286	£321	
0.75	M3BP 80 MB	2.4	1.81	80.6	£329	£366	
1.1	M3BP 80 MC	3.6	2.4	81.8	£346	£381	
1.5	M3BP 90 SLB	4.9	3.0	82.2	£364	£402	
2.2	M3BP 90 SLC	7.2	4.3	84.7	£453	£489	
3	M3BP 100 LB	9.7	5.9	85.2	£532	£591	
4	M3BP 112 MB	13.1	7.7	86.1	£684	£767	
5.5	M3BP 132 MB	18.3	10.4	88.0	£828	£897	
7.5	M3BP 132 SMC	24.7	14.5	88.6	£999	£1,090	
11	M3BP 160 MLA	35.7	19.2	90.7	£1,126	£1,240	
15	M3BP 160 MLB	48.8	26.0	91.5	£1,338	£1,459	
18.5	M3BP 160 MLC	60.2	31.5	92.0	£1,633	£1,740	
22	M3BP 160 MLA	71.6	38.0	91.7	£1,913	£1,990	HO
22	M3BP 180 MLA	71.1	39.5	92.2	£1,990	£2,082	
30	M3BP 160 MLE	97.9	51.8	91.7	£2,407	£2,547	HO
30	M3BP 180 MLB	97.1	53.0	92.8	£2,407	£2,547	HO
30	M3BP 200 MLA	96.9	51.6	93.1	£2,577	£2,685	
37	M3BP 200 MLB	119	63.5	93.4	£3,753	£3,907	
45	M3BP 200 MLC	145	79.1	93.3	£4,313	£4,471	HO
45	M3BP 225 SMA	145.0	78.8	93.6	£4,794	£4,962	
55	M3BP 200 MLD	177.0	95.0	93.8	£5,491	£5,709	HO
55	M3BP 225 SMB	177	96.0	93.9	£5,491	£5,709	HO
55	M3BP 250 SMA	177.0	95.8	94.1	£5,738	£5,927	
75	M3BP 225 SMC	241.0	136.0	94.5	£6,837	£7,049	HO
75	M3BP 280 SMA	240	130	94.3	£7,333	£7,753	

Output kW	Frame size	Torque Nm	Current I	Eff*	Foot price	Flange price	
3000 r/min = 2 poles							
90	M3BP 250 SMC	289.0	153.0	95.0	£7,950	£8,141	HO
90	M3BP 280 SMB	288	152	94.6	£8,348	£8,601	
110	M3BP 280 SMC	352.0	185.0	95.1	£10,082	£10,425	HO
110	M3BP 315 SMA	352	194	94.9	£10,996	£11,357	
132	M3BP 315 SMB	422	227	95.1	£12,156	£12,529	
160	M3BP 315 SMC	512	271	95.4	£13,893	£14,269	
200	M3BP 315 MLA	640	335	95.7	£19,341	£21,223	
250	M3BP 315 LKA	801.0	423.0	95.7	£22,935	£23,619	HO
250	M3BP 355 SMA	800	423	95.7	£24,474	£25,672	
315	M3BP 315 LKC	1009.0	533.0	95.7	£28,754	£29,438	HO
315	M3BP 355 SMB	1009	533	95.7	£30,805	£32,004	
355	M3BP 355 SMC	1136	608	95.7	£34,744	£35,941	
400	M3BP 355 MLA	1280	677	96.9	£38,849	£40,047	
450	M3BP 355 MLB	1440	743	97.1	£44,324	£45,523	
500	M3BP 355 LKA	1601	827	96.9	£47,234	£48,431	
560	M3BP 355 LKB	1792	925	97.0	£53,052	£54,250	
560	M3BP 400 LA	1789	934	97.2	£55,619	£57,159	
560	M3BP 400 LKA	1789	934	97.2	£57,140	£58,679	
630	M3BP 400 LKB	2014	1048	97.4	£63,299	£64,839	
630	M3BP 400 LB	2014	1048	97.4	£61,778	£63,319	
710	M3BP 400 LC	2269	1180	97.5	£69,651	£71,189	
710	M3BP 400 LKC	2269	1180	97.5	£71,171	£72,708	
800	M3BP 450 LA	2554	1349	97.2	£78,010	£80,400	
900	M3BP 450 LB	2874	1517	97.3	£85,030	£87,640	

HO = High-output design

* Efficiency full load 100%

Process performance cast iron motors, 71-450, 4 poles IE2

TEFC low voltage motors, cast iron frame, IP 55, IC 411, single-speed. 400 V 3-phase 50 Hz
See product catalogues or **www.abb.com/motors&generators** for more information on products.

Output kW	Frame size	Torque Nm	Current I	Eff*	Foot price	Flange price	
1500 r/min = 4 poles							
0.25	M3BP 71 MA	1.74	0.65	68.3	£225	£263	
0.37	M3BP 71 MB	2.5	0.88	72.4	£267	£305	
0.55	M3BP 80 MA	3.7	1.45	74.5	£310	£348	
0.75	M3BP 80 MD	5.0	1.83	81.0	£316	£353	
1.1	M3BP 90 SLB	7.3	2.3	83.6	£346	£381	
1.5	M3BP 90 SLD	10.0	3.0	84.3	£417	£454	
2.2	M3BP 100 LC	14.4	4.7	85.9	£473	£532	
3	M3BP 100 LD	19.7	6.3	86.8	£538	£602	
4	M3BP 112 MB	26.5	8.2	86.8	£668	£720	
5.5	M3BP 132 SMB	35.9	11.1	89.0	£850	£910	
7.5	M3BP 132 SMC	49.3	14.9	89.3	£1,047	£1,107	
11	M3BP 160 MLA	71.6	20.9	90.4	£1,117	£1,230	
15	M3BP 160 MLB	97.4	28.5	91.4	£1,392	£1,530	
18.5	M3BP 160 MLC	120	34.7	91.4	£1,586	£1,710	HO
18.5	M3BP 180 MLA	119	34.5	91.9	£1,666	£1,773	
22	M3BP 160 MLD	143	40.7	91.6	£1,946	£2,014	HO
22	M3BP 180 MLB	142	40.9	92.4	£1,990	£2,066	
30	M3BP 180 MLC	194	56.5	92.3	£2,329	£2,469	HO
30	M3BP 200 MLA	193	55.3	93.2	£2,609	£2,749	
37	M3BP 200 MLB	238	67.2	93.4	£3,229	£3,431	HO
37	M3BP 225 SMA	238	68.0	93.4	£3,508	£3,694	
45	M3BP 200 MLC	290	83.6	93.6	£3,922	£4,092	HO
45	M3BP 225 SMB	290	81.3	93.9	£4,111	£4,313	
55	M3BP 225 SMC	355	99.3	94.0	£4,825	£5,059	HO
55	M3BP 250 SMA	354	98.9	94.4	£4,962	£5,198	
73	M3BP 225 SMD	472	132	93.6	£5,777	£6,106	HO
75	M3BP 250 SMB	484	134	94.4	£5,969	£6,359	HO
75	M3BP 280 SMA	482	134	94.5	£6,251	£6,627	

Output kW	Frame size	Torque Nm	Current I	Eff*	Foot price	Flange price	
1500 r/min = 4 poles							
90	M3BP 250 SMC	581	163	94.7	£7,367	£7,526	HO
90	M3BP 280 SMB	579	159	94.7	£7,504	£7,896	
110	M3BP 280 SMC	707	194	95.1	£8,556	£8,946	HO
110	M3BP 315 SMA	706	194	95.1	£9,259	£9,667	
132	M3BP 315 SMB	847	232	95.4	£10,935	£11,310	
160	M3BP 315 SMC	1027	284	95.6	£12,781	£13,156	
200	M3BP 315 MLA	1285	351	95.6	£18,167	£18,637	
250	M3BP 315 LKA	1605	438	95.7	£19,887	£20,515	HO
250	M3BP 355 SMA	1604	437	95.9	£21,454	£22,081	
280	M3BP 315 LKB	1798	484	95.8	£24,585	£25,210	HO
315	M3BP 315 LKC	2021	551	95.8	£26,933	£27,559	HO
315	M3BP 355 SMB	2021	551	95.9	£28,500	£29,439	
355	M3BP 355 SMC	2279	621	95.9	£30,380	£31,317	
400	M3BP 355 MLA	2565	705	96.3	£34,449	£35,075	
450	M3BP 355 MLB	2884	780	96.8	£38,989	£39,303	
500	M3BP 355 LKA	3204	865	97.0	£43,218	£43,530	
560	M3BP 355 LKB	3588	981	96.9	£47,132	£47,444	
560	M3BP 400 LKA	3586	982	96.8	£49,480	£50,106	
560	M3BP 400 LA	3586	982	96.8	£49,480	£50,106	
630	M3BP 400 LB	4034	1077	97.0	£54,960	£55,585	
630	M3BP 400 LKB	4034	1077	97.0	£57,672	£59,210	
710	M3BP 400 LC	4547	1227	97.1	£65,029	£66,568	
710	M3BP 400 LKC	4547	1227	97.1	£66,552	£68,090	
800	M3BP 450 LA	5120	1385	96.9	£74,540	£76,260	
900	M3BP 450 LB	5760	1555	97.1	£81,994	£83,886	
1000	M3BP 450 LC	6404	1726	97.2	£90,193	£92,275	

HO = High-output design

* Efficiency full load 100%

Process performance cast iron motors, 71-450, 6 & 8+ poles IE2

TEFC low voltage motors, cast iron frame, IP 55, IC 411, single-speed. 400 V 3-phase 50 Hz
See product catalogues or **www.abb.com/motors&generators** for more information on products.

Output kW	Frame size	Torque Nm	Current I	Eff*	Foot price	Flange price	
1000 r/min = 6 poles							
0.18	M3BP 71 MA	1.9	0.57	63.7	£238	£256	
0.25	M3BP 71 MB	2.6	0.77	67.2	£263	£302	
0.37	M3BP 80 MA	3.8	1.09	71.0	£312	£350	
0.55	M3BP 80 MB	5.7	1.51	73.9	£315	£351	
0.75	M3BP 90 SLC	7.4	2.3	78.7	£348	£382	
1.1	M3BP 90 SLE	11.2	3.0	78.2	£417	£454	
1.5	M3BP 100 L	15.0	3.8	82.2	£518	£573	
2.2	M3BP 112 MB	22.1	5.5	82.5	£639	£696	
3	M3BP 132 SMB	29.3	8.0	85.3	£828	£891	
4	M3BP 132 SMC	39.7	10.0	84.9	£939	£996	
5.5	M3BP 132 SMF	54.4	12.9	86.1	£1,014	£1,077	
7.5	M3BP 160 MLA	73.4	15.4	88.6	£1,112	£1,222	
11	M3BP 160 MLB	108	22.5	89.3	£1,619	£1,735	
15	M3BP 160 MLC	147	31.3	89.7	£1,832	£1,956	HO
15	M3BP 180 MLA	146	31.0	90.5	£1,990	£2,129	
18.5	M3BP 180 MLB	181	37.2	90.7	£2,299	£2,423	HO
18.5	M3BP 200 MLA	178	36.4	91.6	£2,375	£2,533	
22	M3BP 200 MLB	212	42.0	92.0	£2,639	£2,812	
30	M3BP 200 MLC	290	56.7	92.0	£3,772	£3,973	HO
30	M3BP 225 SMA	290	56.2	92.7	£4,145	£4,344	
37	M3BP 225 SMB	358	69.1	93.1	£4,655	£4,808	HO
37	M3BP 250 SMA	357	69.9	93.1	£4,855	£5,074	
45	M3BP 250 SMB	434	83.7	93.4	£6,824	£7,041	HO
45	M3BP 280 SMA	434	82.7	93.4	£7,114	£7,348	
55	M3BP 250 SMC	531	101	93.2	£7,526	£7,791	HO
55	M3BP 280 SMB	530	100	93.8	£7,741	£7,991	

Output kW	Frame size	Torque Nm	Current I	Eff*	Foot price	Flange price	
1000 r/min = 6 poles							
75	M3BP 280 SMC	723	136	94.2	£8,900	£9,259	HO
75	M3BP 315 SMA	721	139	94.4	£9,524	£9,917	
90	M3BP 315 SMB	866	163	94.8	£11,198	£11,794	
110	M3BP 315 SMC	1059	201	95.0	£13,612	£14,206	
132	M3BP 315 MLA	1271	240	95.3	£16,759	£17,854	
160	M3BP 315 LKA	1540	291	95.3	£18,793	£19,418	HO
160	M3BP 355 SMA	1538	291	95.4	£19,106	£20,203	
180	M3BP 315 LKB	1732	328	95.3	£20,985	£21,611	HO
200	M3BP 315 LKC	1931	355	95.4	£23,332	£23,960	HO
200	M3BP 355 SMB	1923	359	95.7	£23,802	£24,898	
250	M3BP 355 SMC	2404	454	95.7	£29,439	£30,536	
315	M3BP 355 MLB	3032	572	95.7	£35,389	£36,485	
355	M3BP 355 LKA	3417	645	95.7	£42,123	£43,218	
400	M3BP 355 LKB	3850	724	96.0	£44,313	£45,253	
400	M3BP 400 LA	3846	731	96.2	£46,973	£50,261	
400	M3BP 400 LKA	3846	731	96.2	£46,973	£50,261	
450	M3BP 400 LKB	4323	819	96.6	£53,082	£56,839	
450	M3BP 400 LKB	4323	819	96.6	£53,082	£56,839	
500	M3BP 400 LC	4808	900	96.6	£58,875	£63,100	
500	M3BP 400 LKC	4808	900	96.6	£58,875	£63,100	
560	M3BP 400 LD	5385	981	96.9	£65,294	£69,991	
560	M3BP 400 LKD	5385	981	96.9	£65,294	£69,991	
630	M3BP 450 LA	6052	1119	96.7	£66,727	£71,020	
710	M3BP 450 LB	6814	1244	96.9	£71,762	£75,790	
800	M3BP 450 LC	7677	1418	96.9	£79,500	£84,270	

Output kW	Frame size	Torque Nm	Current I	Eff*	Foot price	Flange price	
750 r/min = 8 poles							
0.18	M3BP 80 MA	2.4	0.73	57.4	£214	£250	
0.25	M3BP 80 MB	3.5	0.90	61.5	£244	£281	
0.37	M3BP 90 SLB	5.0	1.49	66.3	£296	£330	
0.55	M3BP 90 SLC	8.0	1.91	61.8	£363	£395	
0.75	M3BP 100 LA	10.0	2.3	74.0	£435	£480	
1.1	M3BP 100 LB	15.1	3.1	76.0	£555	£600	
1.5	M3BP 112 M	20.7	4.1	74.4	£670	£724	
2.2	M3BP 132 SMA	29.3	6.0	79.7	£860	£925	
3	M3BP 132 SMB	40.0	8.4	79.9	£1,026	£1,095	
4	M3BP 160 MLA	52.4	10.2	84.1	£1,141	£1,261	
5.5	M3BP 160 MLB	72.3	13.9	84.7	£1,203	£1,314	
7.5	M3BP 160 MLC	98.5	19.3	86.1	£1,454	£1,569	
11	M3BP 180 MLA	143	27.3	86.8	£2,204	£2,299	
15	M3BP 200 MLA	194	32.4	90.2	£2,672	£2,840	
18.5	M3BP 225 SMA	239	40.1	91.0	£3,460	£3,614	
22	M3BP 225 SMB	284	46.8	91.6	£4,236	£4,436	
30	M3BP 250 SMA	386	66.0	92.4	£5,088	£5,337	
37	M3BP 280 SMA	476	73.8	92.7	£7,348	£7,598	
45	M3BP 280 SMB	579	89.3	93.2	£7,801	£8,069	
55	M3BP 280 SMC	708	106	93.4	£8,900	£9,243	HO
55	M3BP 315 SMA	707	104	93.4	£9,493	£9,869	

Output kW	Frame size	Torque Nm	Current I	Eff*	Foot price	Flange price	
750 r/min = 8 poles							
75	M3BP 315 SMB	966	140	93.7	£11,527	£12,124	
90	M3BP 315 SMC	1159	168	94.0	£14,128	£14,722	
110	M3BP 315 MLA	1419	203	94.0	£17,228	£17,854	
132	M3BP 315 LKA	1703	243	94.1	£18,444	£18,974	HO
132	M3BP 355 SMA	1694	251	94.7	£20,670	£21,454	
150	M3BP 315 LKB	1933	276	94.3	£20,670	£21,454	HO
160	M3BP 315 LKC	2064	295	94.2	£21,836	£22,578	HO
160	M3BP 355 SMB	2053	303	95.2	£23,488	£24,585	
200	M3BP 355 SMC	2570	378	95.3	£32,571	£33,511	
250	M3BP 355 MLB	3213	472	95.4	£40,554	£41,493	
315	M3BP 355 LKB	4053	595	95.5	£49,012	£49,792	
315	M3BP 400 LA	4043	584	96.1	£51,987	£52,767	
315	M3BP 400 LKA	4043	584	96.1	£51,987	£52,767	
355	M3BP 400 LB	4562	641	96.2	£58,718	£59,031	
355	M3BP 400 LKB	4562	641	96.2	£58,718	£59,031	
400	M3BP 400 LC	5134	731	96.3	£65,135	£65,448	
400	M3BP 400 LKC	5134	731	96.3	£65,135	£65,448	
450	M3BP 450 LA	5775	813	96.2	£68,370	£71,105	
500	M3BP 450 LB	6417	902	96.3	£76,108	£79,153	
560	M3BP 450 LC	7187	1022	96.4	£82,680	£85,988	
630	M3BP 450 LD	8075	1162	96.6	£91,160	£94,807	

HO = High-output design * Efficiency full load 100% + IE2 not applicable to 8-pole

Process performance aluminium motors, 63-280
2, 4, 6 & 8+ poles

IE2

TEFC low voltage motors, aluminium, IP 55, IC 411, single-speed. 400 V 3-phase 50 Hz
See product catalogues or **www.abb.com/motors&generators** for more information on products.

Output kW	Frame size	Torque Nm	Current I	Eff*	Foot price	Flange price
3000 r/min = 2 poles						
0.18	M3AA 63 A	0.60	0.55	75.0	£137	£156
0.25	M3AA 63 B	0.84	0.66	78.6	£139	£158
0.37	M3AA 71 A	1.26	0.95	73.8	£149	£167
0.55	M3AA 71 B	1.88	1.29	78.4	£157	£176
0.75	M3AA 80 B	2.4	1.70	80.6	£208	£226
1.1	M3AA 80 C	3.6	2.4	80.6	£263	£302
1.5	M3AA 90 L	4.9	2.9	84.1	£312	£352
2.2	M3AA 90 LB	7.3	4.4	84.6	£386	£426
3	M3AA 100 LB	9.8	5.8	86.4	£470	£522
4	M3AA 112 MB	13.2	7.6	86.1	£556	£609
5.5	M3AA 132 SB	18.0	11.0	88.0	£728	£797
7.5	M3AA 132 SC	24.5	14.0	88.5	£923	£996
11	M3AA 160 MLA	35.7	19.2	90.7	£1,134	£1,230
15	M3AA 160 MLB	48.8	26.0	91.5	£1,473	£1,582
18.5	M3AA 160 MLC	60.2	31.5	92.0	£1,768	£1,876
22	M3AA 180 MLA	71.1	39.5	92.2	£2,016	£2,155
30	M3AA 200 MLA	96.9	51.6	93.1	£2,544	£2,697
37	M3AA 200 MLB	119.0	63.5	93.4	£3,318	£3,504
45	M3AA 225 SMA	145.0	78.8	93.6	£4,774	£4,979
55	M3AA 250 SMA	177.0	95.8	94.1	£5,585	£5,808
75	M3AA 280 SMA	241.0	128.0	94.5	£6,894	£7,073
90	M3AA 280 SMB	289.0	153.0	95.0	£8,077	£8,290

Output kW	Frame size	Torque Nm	Current I	Eff*	Foot price	Flange price
1500 r/min = 4 poles						
0.12	M3AA 63 A	0.81	0.46	65.5	£133	£152
0.18	M3AA 63 B	1.24	0.62	67.3	£135	£154
0.25	M3AA 71 A	1.74	0.72	65.1	£141	£160
0.37	M3AA 71 B	2.5	0.96	69.7	£150	£179
0.55	M3AA 80 A	3.8	1.41	72.8	£179	£208
0.75	M3AA 80 E	5.0	1.8	79.9	£257	£282
1.1	M3AA 90 LB	7.3	2.4	83.7	£322	£355
1.5	M3AA 90 LD	9.9	3.3	84.2	£386	£420
2.2	M3AA 100 LC	14.4	4.6	87.1	£438	£489
3	M3AA 100 LD	19.8	6.3	85.7	£491	£541
4	M3AA 112 MB	26.4	8.8	86.7	£586	£640
5.5	M3AA 132 M	35.8	11.2	89.0	£750	£818
7.5	M3AA 132 MA	49.0	15.3	89.1	£963	£1,035
11	M3AA 160 MLA	71.6	20.9	90.4	£1,157	£1,253
15	M3AA 160 MLB	97.4	28.5	91.4	£1,501	£1,596
18.5	M3AA 180 MLA	119	34.5	91.9	£1,706	£1,845
22	M3AA 180 MLB	142	40.9	92.4	£2,047	£2,186
30	M3AA 200 MLA	193	55.3	93.2	£2,636	£2,822
37	M3AA 225 SMA	238	68.0	93.4	£3,353	£3,589
45	M3AA 225 SMB	290	81.3	93.9	£4,081	£4,318
55	M3AA 250 SMA	354	98.9	94.4	£4,876	£5,077
75	M3AA 280 SMA	484	135.0	94.3	£6,251	£6,466
90	M3AA 280 SMB	581	163	94.7	£7,335	£7,534

Output kW	Frame size	Torque Nm	Current I	Eff*	Foot price	Flange price
1000 r/min = 6 poles						
0.09	M3AA 63 A	0.94	0.49	47.1	£145	£164
0.12	M3AA 63 B	1.25	0.51	57.5	£150	£170
0.18	M3AA 71 A	1.94	0.61	59.5	£163	£184
0.25	M3AA 71 B	2.6	0.79	64.0	£186	£210
0.37	M3AA 80 A	3.9	1.07	68.0	£205	£231
0.55	M3AA 80 B	5.8	1.58	68.7	£229	£260
0.75	M3AA 90 LB	7.7	1.96	77.6	£280	£307
1.1	M3AA 90 LD	11.2	3.0	78.2	£345	£368
1.5	M3AA 100 LC	15.1	3.6	80.3	£395	£426
2.2	M3AA 112 MB	21.9	5.3	81.9	£496	£529
3	M3AA 132 S	29.8	7.9	83.3	£628	£671
4	M3AA 132 MB	39.1	9.5	86.4	£769	£807
5.5	M3AA 132 MC	54.4	13.7	86.1	£950	£979
7.5	M3AA 160 MLA	73.4	15.4	88.6	£1,230	£1,326
11	M3AA 160 MLB	108	22.5	89.3	£1,675	£1,768
15	M3AA 180 MLA	146	31.0	90.5	£2,093	£2,233
18.5	M3AA 200 MLA	178	36.4	91.6	£2,512	£2,698
22	M3AA 200 MLB	212	42.0	92.0	£2,962	£3,148
30	M3AA 225 SMA	290	56.2	92.7	£4,149	£4,352
37	M3AA 250 SMA	357	69.9	93.1	£4,931	£5,179
45	M3AA 280 SMA	434	82.9	93.2	£5,778	£5,990
55	M3AA 280 SMB	531	101	93.2	£7,068	£7,458

Output kW	Frame size	Torque Nm	Current I	Eff*	Foot price	Flange price
750 r/min = 8 poles						
0.09	M3AA 71 A	1.27	0.46	48.4	£165	£182
0.12	M3AA 71 B	1.72	0.56	51.5	£184	£208
0.18	M3AA 80 A	2.4	0.74	57.2	£208	£234
0.25	M3AA 80 B	3.4	0.97	61.4	£217	£245
0.37	M3AA 90 S	5.0	1.66	59.4	£290	£323
0.55	M3AA 90 L	7.9	2.3	59.1	£355	£388
0.75	M3AA 100 LA	9.9	3.2	70.7	£422	£465
1.1	M3AA 100 LB	15.1	3.1	76.0	£526	£568
1.5	M3AA 112 M	20.7	4.1	74.4	£636	£686
2.2	M3AA 132 S	29.3	6.2	77.7	£807	£868
3	M3AA 132 M	40.0	8.5	79.3	£942	£1,006
4	M3AA 160 MLA	52.4	10.2	84.1	£1,134	£1,230
5.5	M3AA 160 MLB	72.3	13.9	84.7	£1,411	£1,504
7.5	M3AA 160 MLC	98.5	19.3	86.1	£1,690	£1,783
11	M3AA 180 MLA	144	23.9	88.5	£2,233	£2,372
15	M3AA 200 MLA	194	32.4	90.2	£2,807	£2,993
18.5	M3AA 225 SMA	239	40.1	91.0	£3,442	£3,659
22	M3AA 225 SMB	284	46.8	91.6	£4,199	£4,385
30	M3AA 250 SMA	386	66.0	92.4	£5,011	£5,215
37	M3AA 280 SMA	477	78.1	92.3	£5,752	£5,982

High output design motors available on request.

* Efficiency full load 100%

+ IE2 not applicable to 8-pole

Premium efficiency process performance motors
Innovative thinking – highest efficiency and reliability with off-the-shelf availability

ABB's new generation process performance premium efficiency motors deliver maximum value over their entire life cycle. Their IE3 efficiency rating makes them an ideal environmental choice for motor users seeking to save energy and reduce their carbon footprint.

New levels of efficiency

Rising energy costs and increasing concerns about the environment are focusing attention on ways to further reduce energy consumption. Motor-driven systems account for 65 percent of all the electricity used in industry, giving motors a major role to play in efforts to reduce energy use.

Cutting-edge design, quality materials and advanced manufacturing techniques make ABB's process performance premium efficiency motors extremely reliable and energy efficient, even under the most challenging conditions.

Future-proof solution

ABB motors comply with the latest efficiency standards and requirements. ABB closely follows developments in the global regulatory environment and ensures that its products stay ahead.

Process performance premium efficiency motors with the IE3 efficiency rating already meet the requirements of the EU MEPS (European Minimum Energy Performance Standard) scheme set to come into force in 2015. These motors are available now for delivery from stock.

Motors for the super premium IE4 efficiency class are also available from 160 to 355 frame size.

Excellent all-round performance

Process performance premium efficiency motors offer enhanced operating performance, low starting currents, and an excellent torque curve. They produce less noise, are subject to lower mechanical stresses, and run cooler than less efficient motors.

Cooler running is a big advantage. Reducing the temperature of the bearings and windings extends the lubrication intervals and increases the useful life of the motor. This translates into higher reliability, easier maintenance, and a longer life cycle – factors which reduce the overall cost of ownership. As a result, ABB's process performance premium efficiency motors have longer warranties than many other types of motor.

With an extensive range of accessories available, ABB's process performance premium efficiency motors are particularly suitable for industrial and OEM use. They are ideal for all applications demanding efficiency and reliability, especially under challenging conditions.

Motor types	M3BP & M3AA
Frame sizes	80-355 & 80-250
Output range	0.75 kW to 355 kW
Poles	2 to 6 poles
Frame material	Cast iron & aluminium
Voltage	up to 690 V, 50 & 60 Hz

Premium efficiency process performance cast iron motors, 160-355, 2, 4 & 6 poles

IE3

TEFC low voltage motors, cast iron frame, IP 55, IC 411, single-speed. 400 V 3-phase 50 Hz
See product catalogues or **www.abb.com/motors&generators** for more information on products.

Output kW	Frame size	Torque Nm	Current I	Eff*	Foot price	Flange price
3000 r/min = 2 poles						
11	M3BP 160 MLA	35.6	18.7	92.1	£1,734	£1,880
15	M3BP 160 MLB	48.6	25.4	92.6	£2,257	£2,428
18.5	M3BP 160 MLC	60	30.8	93.1	£2,712	£2,864
22	M3BP 180 MLA	71	37.4	93.2	£3,054	£3,262
30	M3BP 200 MLA	96.8	51	94.2	£3,812	£4,096
37	M3BP 200 MLB	119	61.9	94.7	£5,007	£5,272
45	M3BP 225 SMA	144	76.8	95.0	£6,031	£6,353
55	M3BP 250 SMA	176	93.6	95.2	£7,320	£7,680
75	M3BP 280 SMB	240	130	95.5	£8,855	£9,362
90	M3BP 280 SMC	288	154	95.7	£10,082	£10,387
110	M3BP 315 SMB	352	190	95.9	£13,279	£13,715
132	M3BP 315 SMC	422	225	95.9	£14,679	£15,130
160	M3BP 315 MLA	512	267	96.1	£16,776	£17,231
200	M3BP 315 MLB	640	333	96.2	£23,356	£25,628
200	M3BP 355 SMA	640	337	96.2	£28,350	£31,080
250	M3BP 315 LKB	800	411	96.3	£27,720	£30,450
250	M3BP 355 SMB	800	416	96.3	£29,554	£31,000
315	M3BP 355 SMC	1008	529	96.4	£37,198	£38,646
355	M3BP 355 MLA	1136	589	96.5	£41,954	£43,400

Output kW	Frame size	Torque Nm	Current I	Eff*	Foot price	Flange price
1500 r/min = 4 poles						
11	M3BP160 MLA	71.3	20.4	92.3	£1,770	£1,916
15	M3BP160 MLB	97.1	27.8	92.7	£2,295	£2,447
18.5	M3BP180 MLA	119	34.9	93.3	£2,598	£2,807
22	M3BP180 MLB	141	41.5	93.3	£3,110	£3,319
30	M3BP200 MLA	193	54.6	94.4	£3,964	£4,248
37	M3BP225 SMA	238	65.4	94.9	£4,817	£5,139
45	M3BP225 SMB	289	80.2	95.2	£5,822	£6,144
55	M3BP250 SMA	353	97.8	95.4	£7,017	£7,396
75	M3BP280 SMB	481	133	95.7	£7,549	£8,004
90	M3BP280 SMC	577	159	95.9	£9,062	£9,536
110	M3BP315 SMC	704	193	96.3	£11,181	£11,674
132	M3BP315 SMD	845	232	96.4	£13,205	£13,658
160	M3BP315 MLB	1026	278	96.4	£15,434	£15,887
200	M3BP315 LKB	1281	343	96.5	£20,176	£21,938
200	M3BP355 SMA	1281	343	96.5	£21,410	£22,938
250	M3BP315 LKC	1601	429	96.6	£24,402	£24,612
250	M3BP355 SMB	1601	249	96.6	£25,907	£26,664
315	M3BP355 SMC	2017	553	96.7	£34,414	£35,548
355	M3BP355 MLA	2273	616	96.7	£36,684	£37,816

Output kW	Frame size	Torque Nm	Current I	Eff*	Foot price	Flange price
1000 r/min = 6 poles						
7.5	M3BP160 MLA	73	15.2	90.8	£1,880	£2,030
11	M3BP160 MLB	107	23.5	91.2	£2,560	£2,712
15	M3BP180 MLA	146	30.4	92.2	£3,186	£3,395
18.5	M3BP200 MLA	178	37.3	92.9	£3,793	£4,059
22	M3BP200 MLB	212	43	93.3	£4,457	£4,741
30	M3BP225 SMA	289	56.8	94.1	£6,107	£6,429
37	M3BP250 SMA	356	68	94.5	£7,320	£7,680
45	M3BP280 SMB	433	79.6	94.8	£8,592	£8,874
55	M3BP280 SMC	530	97	95.1	£9,349	£9,650
75	M3BP315 SMC	721	135	95.3	£11,501	£11,976
90	M3BP315 SMD	864	163	95.5	£13,522	£14,243
110	M3BP315 MLB	1057	197	95.5	£16,437	£17,154
132	M3BP315 LKA	1269	239	95.7	£20,237	£21,560
160	M3BP315 LKC	1537	290	95.9	£22,910	£23,448
160	M3BP355 SMB	1535	290	95.9	£23,617	£24,921
200	M3BP355 SMC	1919	362	96.0	£29,558	£30,717
250	M3BP355 MLB	2399	452	96.0	£36,368	£37,527
315	M3BP355 LKA	3026	570	96.0	£43,612	£44,916
355	M3BP355 LKB	3407	667	96.0	£52,016	£53,175

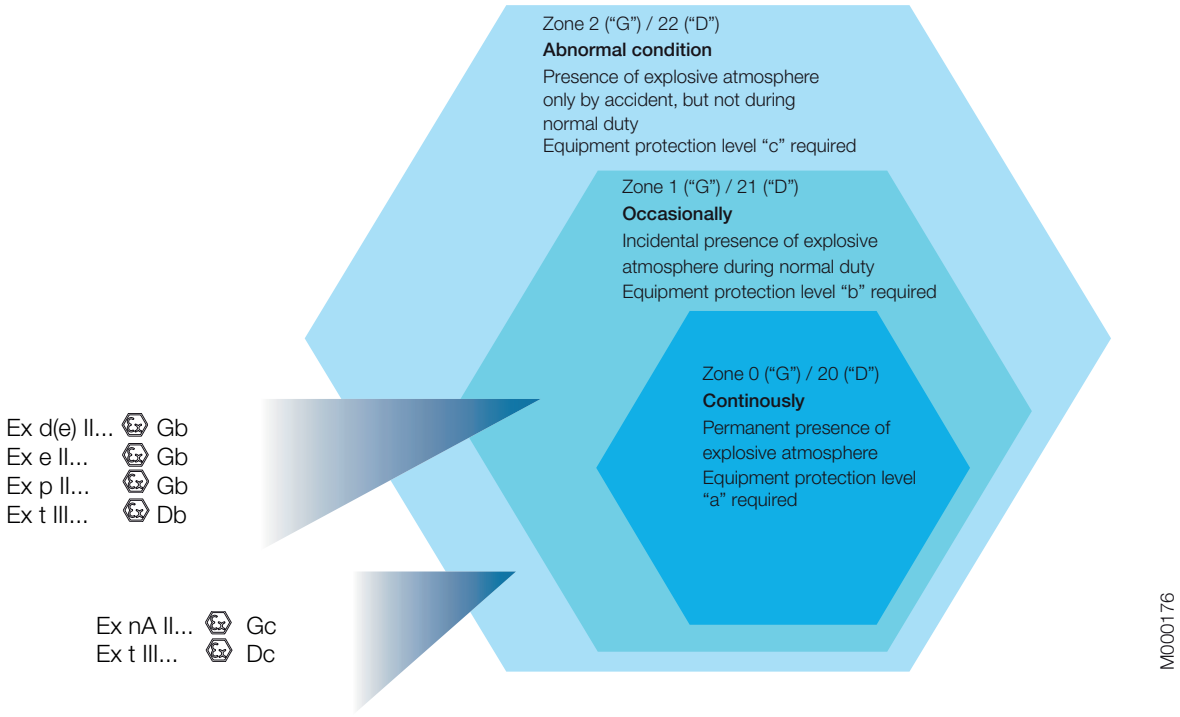
* Efficiency full load 100%
Range available from 1.1 to 7.5 for 2 pole
0.55 to 7.5 - 4 pole, price on request

Explosive atmospheres

There are systems in place worldwide to classify explosive atmospheres by zones, according to the risk posed by explosive gas (‘G”) or dust (“D”).

M000168

M000169


Zone 2 (“G”) / 22 (“D”)
Abnormal condition
Presence of explosive atmosphere only by accident, but not during normal duty
Equipment protection level “c” required
Zone 1 (“G”) / 21 (“D”)
Occasionally
Incidental presence of explosive atmosphere during normal duty
Equipment protection level “b” required
Zone 0 (“G”) / 20 (“D”)
Continously
Permanent presence of explosive atmosphere
Equipment protection level “a” required
Ex d(e) II... Gb
Ex e II... Gb
Ex p II... Gb
Ex t III... Db
Ex nA II... Gc
Ex t III... Dc

M000176

Classification of explosive atmospheres according to CENELEC and IEC

The following standards define areas according to the presence of gas or dust in the atmosphere:

IEC/EN 60079-10-1 Gas
IEC/EN 60079-10-2 Dust

Standard IEC 60079-0 EN 60079-0			Installation Zone acc. to IEC 60079-10-x EN 60079-10-x	Atex Directive 94/9/EC		Main motor Protection Types
Group	**EPL**	**Protection level**	**Zones**	**Equipment group**	**Equipment category**	
I	Ma	very high	NA	I	M1	NA
(Mines)	Mb	high		(Mines)	M2	
II	Ga	very high	0	II	1G	NA
(Gas)	Gb	high	1	(Surface)	2G	Ex d/Ex de, Ex p, Ex e
	Gc	enhanced	2		3G	Ex nA
III	Da	very high	20		1D	NA
(Dust)	Db	high	21		2D	Ex tb IP 65
	Dc	enhanced	22		3D	Ex tc, IP 65/IP 55

Making of temperatures, gas groups and explosive atmospheres

To ensure equipment can be safely used in potentially explosive atmospheres, the explosive atmospheres where the equipment is installed must be known. The temperature class of equipment must be compared with the spontaneous ignition the equipment of the gas mixtures concerned, and in specific cases the gas group must be known (e.g.flame proof protection).

Clasification

Gas classification

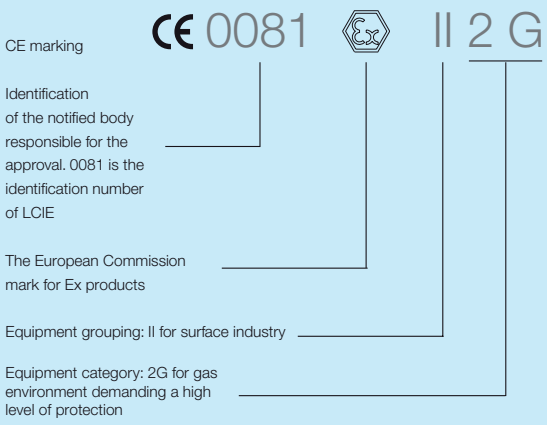
Temperature class	Ignition temp. of gas/ vapour °C	Max. permitted temp. of equipment °C	Gas examples
T1	>450	450	Hydrogen
T2	>300 <450	300	Ethanol
T3	>200 <300	200	Hydrogen sulfide
T4	>135 <200	135	Diethyl ether
T5	>100 <135	100	-
T6	>85 <100	85	Carbon disulfide

Gas subdivision

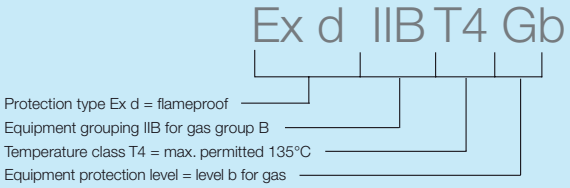
IIA	- 120 gases and vapours, e.g. butane/petroleum/propane
IIB	- 30 gases and vapours, e.g. ethylene/dimethyl ether/coke oven gas
IIC	three gases: hydrogen H_2/acetylene C_2H_2 carbon disulfide CS_2

Marking of equipment protection for gas according to ATEX

CE Conformity marking

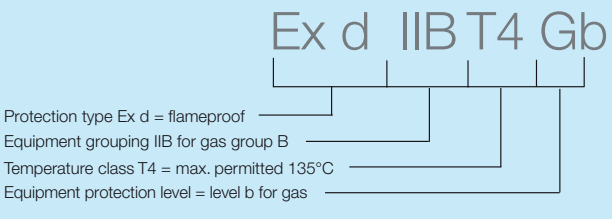

CE 0081
II 2 G
CE marking
Identification of the notified body responsible for the approval. 0081 is the identification number of LCIE
The European Commission mark for Ex products
Equipment grouping: II for surface industry
Equipment category: 2G for gas environment demanding a high level of protection

Equipment protection marking for gas:


Ex d IIB T4 Gb
Protection type Ex d = flameproof
Equipment grouping IIB for gas group B
Temperature class T4 = max. permitted 135°C
Equipment protection level = level b for gas

Marking of equipment protection for gas according to IEC

Example for gas:


Ex d IIB T4 Gb
Protection type Ex d = flameproof
Equipment grouping IIB for gas group B
Temperature class T4 = max. permitted 135°C
Equipment protection level = level b for gas

Flameproof motors, 80-400, 2 & 4 poles
Ex d/e* IIB T4

IE2

TEFC low voltage motors, IP 55, IC 411, single-speed. 400 V 3-phase 50 Hz
See product catalogues or **www.abb.com/motors&generators** for more information on products.

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Output kW	Frame size	Torque Nm	Current I	Eff*	Foot price	Flange price	
3000 r/min = 2 poles							
0.75	M3JP/KP 80 MA	2.5	1.55	80.1	£727	£774	
1.1	M3JP/KP 80 MB	3.7	2.2	81.6	£762	£835	
1.5	M3JP/KP 90 SLA	4.9	3	81.9	£842	£914	
2.2	M3JP/KP 90 SLC	7.3	4.2	84.5	£999	£1,062	
3	M3JP/KP 100 LA	9.8	5.5	86.0	£1,058	£1,129	
4	M3JP/KP 112 MB	13.1	7.5	86.0	£1,314	£1,401	
5.5	M3JP/KP 132 SMB	18	10.1	87.0	£1,527	£1,605	
7.5	M3JP/KP 132 SMD	24.5	13.6	88.3	£1,945	£2,009	
11	M3JP/KP 160 MLA	35.8	19.7	90.1	£2,250	£2,410	
15	M3JP/KP 160 MLB	48.9	26.6	91.2	£2,666	£2,779	
18.5	M3JP/KP 160 MLC	60.2	32.3	91.8	£3,033	£3,115	
22	M3JP/KP 180 MLA	71.5	38.4	91.7	£3,757	£3,884	
22	M3JP/KP 160 MLD	71.7	38.6	91.2	£3,530	£3,644	HO
30	M3JP/KP 200 MLA	96.9	52.7	93.2	£4,782	£4,974	
30	M3JP/KP 180 MLB	97.3	52	92.5	£4,476	£4,606	HO
37	M3JP/KP 200 MLC	119	64.1	93.6	£6,354	£6,641	
37	M3JP/KP 180 MLC	119	63.9	92.8	£6,266	£6,506	HO
45	M3JP/KP 225 SMB	144	79.5	93.9	£8,596	£8,916	
45	M3JP/KP 200 MLE	145	79.1	93.3	£8,099	£8,457	HO
55	M3JP/KP 250 SMA	176	94.5	94.3	£11,306	£11,723	
55	M3JP/KP 225 SMC	177	96	93.9	£10,617	£11,018	HO
67	M3JP/225 SMD	215	119	93.9	£12,009	£12,749	HO
75	M3JP/KP 280 SMA	240	130	94.3	£15,329	£15,841	
75	M3JP/KP 250 SMB	241	129	94.0	£14,318	£14,815	HO
90	M3JP/KP 280 SMB	288	152	94.6	£20,043	£20,685	
90	M3JP/KP 250 SMC	289	153	94.0	£16,018	£17,041	HO
110	M3JP/KP 315 SMA	352	194	94.9	£24,210	£24,690	
110	M3JP/KP 280 SMC	352	185	95.1	£22,766	£23,249	HO
132	M3JP/KP 315 SMB	422	227	95.1	£28,699	£29,178	
160	M3JP/KP 315 SMC	512	271	95.4	£32,545	£33,025	
200	M3JP/KP 315 MLA	640	335	95.7	£40,879	£41,361	
250	M3JP/KP 355 SMA	800	423	95.7	£44,530	£45,823	
315	M3JP/KP 355 SMB	1009	533	95.7	£54,138	£55,431	
355	M3JP/KP 355 SMC	1136	608	95.7	£58,202	£59,494	
400	M3JP/KP 355 MLA	1280	677	96.9	£64,482	£65,776	
450	M3JP/KP 355 MLB	1440	743	97.1	£72,057	£73,351	
500	M3JP/KP 355 LKA	1601	827	96.9	£83,883	£85,176	
560	M3JP/KP 400 LA	1789	934	97.2	£115,256	£118,623	
560	M3JP/KP 400 LKA	1789	943	97.2	£115,256	£118,623	
630	M3JP/KP 400 LB	2014	1048	97.4	£126,000	£130,485	
630	M3JP/KP 400 KB	2014	1048	97.4	£126,000	£130,485	
710	M3JP/KP 400 LC	2269	1180	97.5	£142,000	£147,000	
710	M3JP/KP 400 LKC	2269	1180	97.5	£142,000	£147,000	

Output kW	Frame size	Torque Nm	Current I	Eff*	Foot price	Flange price	
1500 r/min = 4 poles							
0.55	M3JP/KP 80 MA	3.6	1.41	76.6	£665	£727	
0.75	M3JP/KP 80 MB	5	1.77	80.4	£695	£762	
1.1	M3JP/KP 90 SLA	7.3	2.4	83.3	£740	£805	
1.5	M3JP/KP 90 SLC	10	3.2	83.2	£814	£883	
2.2	M3JP/KP 100 LA	14.5	4.3	84.7	£887	£959	
3	M3JP/KP 100 LB	19.8	6	86.5	£1,155	£1,224	
4	M3JP/KP 112 MC	26.1	8.3	88.2	£1,233	£1,324	
5.5	M3JP/KP 132 SMB	36	11.3	88.5	£1,632	£1,723	
7.5	M3JP/KP 132 SMD	49	16.1	89.1	£1,815	£1,913	
11	M3JP/KP 160 MLC	71.4	21.2	91.2	£2,264	£2,377	
15	M3JP/KP 160 MLE	97.6	28	92.0	£2,808	£2,908	
18.5	M3JP/KP 180 MLA	119	35.1	91.6	£3,515	£3,659	
18.5	M3JP/KP 160 MLF	120	35	91.7	£3,307	£3,403	HO
22	M3JP/KP 180 MLB	142	41.7	91.6	£3,901	£4,044	
22	M3JP/KP 160 MLG	143	43.1	90.8	£3,705	£3,836	HO
30	M3JP/KP 200 MLB	194	54.4	93.6	£4,879	£5,056	
30	M3JP/KP 180 MLC	194	57.9	92.2	£4,573	£4,701	HO
37	M3JP/KP 225 SMB	238	67.1	93.6	£6,002	£6,226	
37	M3JP/KP 200 MLC	239	70	93.0	£5,567	£5,761	HO
45	M3JP/KP 225 SMC	290	78.4	94.1	£7,091	£7,330	
55	M3JP/KP 250 SMA	355	100	94.3	£8,694	£9,109	
55	M3JP/KP 225 SMD	354	101	94.3	£8,211	£8,611	HO
62	M3JP/KP 225 SME	400	113	93.5	£9,360	£10,282	HO
75	M3JP/KP 280 SMA	482	134	94.5	£11,404	£11,931	
75	M3JP/KP 250 SMB	485	133	94.3	£10,729	£11,225	HO
86	M3JP/KP 250 SMC	556	155	94.1	£12,875	£13,470	HO
90	M3JP/KP 280 SMB	579	159	94.7	£15,714	£16,195	
110	M3JP/KP 315 SMA	706	194	95.1	£17,959	£18,599	
110	M3JP/KP 280 SMC	707	194	95.1	£17,799	£18,279	HO
132	M3JP/KP 315 SMB	847	232	95.4	£21,965	£22,445	
160	M3JP/KP 315 SMC	1027	284	95.6	£24,210	£24,690	
200	M3JP/KP 315 MLA	1285	351	95.6	£31,904	£32,383	
250	M3JP/KP 355 SMA	1604	437	95.9	£39,919	£41,041	
315	M3JP/KP 355 SMB	2021	551	95.9	£50,338	£51,459	
355	M3JP/KP 355 SMC	2279	621	95.9	£56,749	£57,871	
400	M3JP/KP 355 MLA	2565	705	96.3	£63,802	£65,246	
450	M3JP/KP 355 MLB	2884	780	96.8	£70,948	£72,241	
500	M3JP/KP 355 LKA	3204	865	97.0	£78,524	£79,817	
560	M3JP/KP 400 LA	3586	982	96.8	£89,425	£91,086	
560	M3JP/KP 400 LKA	3586	982	96.8	£89,425	£91,086	
630	M3JP/KP 400 LB	4034	1077	97.0	£100,671	£104,357	
630	M3JP/KP 400 LKB	4034	1007	97.0	£100,671	£104,357	
710	M3JP/KP 400 LC	4547	1227	97.1	£104,698	£108,531	
710	M3JP/KP 400 LKC	4547	1227	97.1	£104,698	£108,531	

* JP Exd
* KP Exde

HO = High-output design
* Efficiency full load 100%

Flameproof motors, 80-450, 6 & 8+ poles
Ex d/e* IIB T4

IE2

TEFC low voltage motors, IP 55, IC 411, single-speed. 400 V 3-phase 50 Hz
See product catalogues or **www.abb.com/motors&generators** for more information on products.

ATEX Certified

Output kW	Frame size	Torque Nm	Current I	Eff*	Foot price	Flange price	
1000 r/min = 6 poles							
0.37	M3JP/KP 80 MA	3.7	1.14	72.6	£740	£805	
0.55	M3JP/KP 80 MB	5.5	1.55	72.9	£774	£837	
0.75	M3JP/KP 90 SLA	7.5	2	77.9	£807	£859	
1.1	M3JP/KP 90 SLC	11.2	2.8	78.5	£819	£887	
1.5	M3JP/KP 100 LA	15	3.6	80.1	£887	£959	
2.2	M3JP/KP 112 MB	22.1	5	82.0	£1,233	£1,324	
3	M3JP/KP 132 SMB	29.8	6.7	83.3	£1,657	£1,735	
4	M3JP/KP 132 SMC	39.6	9.2	84.6	£1,754	£1,815	
5.5	M3JP/KP 132 SMD	54.3	12.5	87.6	£1,831	£1,945	
7.5	M3JP/KP 160 MLA	74.2	15.3	87.2	£2,264	£2,377	
11	M3JP/KP 160 MLB	108	21.7	90.1	£2,985	£3,082	
14	M3JP/KP 160 MLC	137	30.2	89.2	£3,583	£3,656	HO
15	M3JP/KP 180 MLB	147	29.2	90.4	£3,980	£4,107	
18.5	M3JP/KP 180 MLC	181	40	90.1	£4,497	£4,640	HO
18.5	M3JP/KP 200 MLA	179	35.8	90.9	£4,766	£4,959	
22	M3JP/KP 200 MLB	213	42.2	91.6	£5,278	£5,456	
30	M3JP/KP 200 MLC	291	59	91.6	£6,658	£6,832	HO
30	M3JP/KP 225 SMB	290	57.2	92.2	£7,074	£7,281	
37	M3JP/KP 250 SMA	357	70.8	93.1	£9,078	£9,319	
37	M3JP/KP 225 SMC	359	69.8	92.1	£8,052	£8,274	HO
45	M3JP/KP 280 SMA	434	82.7	93.4	£11,404	£11,931	
45	M3JP/KP 250 SMB	435	85	93.1	£10,280	£10,520	HO
55	M3JP/KP 280 SMB	530	100	93.8	£15,841	£16,356	
75	M3JP/KP 315 SMA	721	139	94.4	£18,118	£18,599	
75	M3JP/KP 280 SMC	723	136	94.2	£16,003	£16,356	HO
90	M3JP/KP 315 SMB	866	163	94.8	£21,965	£22,445	
110	M3JP/KP 315 SMC	1059	201	95.0	£25,332	£25,972	
132	M3JP/KP 315 MLA	1271	240	95.3	£29,019	£29,662	
160	M3JP/KP 355 SMA	1538	291	95.4	£35,752	£36,392	
200	M3JP/KP 355 SMB	1923	359	95.7	£44,566	£45,368	
250	M3JP/KP 355 SMC	2404	454	95.7	£55,466	£56,430	
315	M3JP/KP 355 MLB	3032	572	95.7	£69,896	£70,696	
355	M3JP/KP 355 LKA	3417	645	95.7	£81,478	£82,772	
400	M3JP/KP 400 LA	3846	731	96.2	£88,489	£92,176	
400	M3JP/KP 400 LKA	3846	731	96.2	£88,489	£92,176	
450	M3JP/KP 400 LB	4323	819	96.6	£99,548	£103,874	
450	M3JP/KP 400 LKB	4323	819	96.6	£99,548	£103,874	
500	M3JP/KP 400 LC	4808	900	96.6	£110,700	£115,400	
500	M3JP/KP 400 LKC	4808	900	96.6	£110,700	£115,400	
560	M3JP/KP 400 LD	5385	981	96.9	£117,400	£122,000	
560	M3JP/KP 400 LKD	5385	981	96.9	£117,400	£122,000	
610	M3JP/KP 450 LA	5860	1098	96.6	**Price on request**		

Output kW	Frame size	Torque Nm	Current I	Eff*	Foot price	Flange price	
750 r/min = 8 poles							
0.18	M3JP/KP 80 MA	2.3	0.88	61.0	£741	£805	
0.25	M3JP/KP 80 MB	3.3	0.97	63.8	£780	£841	
0.37	M3JP/KP 90 SLA	5	1.26	67.0	£799	£867	
0.55	M3JP/KP 90 SLC	7.5	1.89	68.7	£878	£948	
0.75	M3JP/KP 100 LA	9.9	2.4	75.9	£963	£1,036	
1.1	M3JP/KP 100 LB	14.6	3.6	76.4	£1,257	£1,324	
1.5	M3JP/KP 112 MC	20	4.7	77.2	£1,328	£1,413	
2.2	M3JP/KP 132 SMC	29.1	6	80.1	£1,784	£1,864	
3	M3JP/KP 132 SMD	40.3	7.7	79.9	£1,992	£2,054	
4	M3JP/KP 160 MLA	52.9	9.3	86.7	£2,153	£2,347	
5.5	M3JP/KP 160 MLB	72.6	12.8	86.8	£2,602	£2,697	
7.5	M3JP/KP 160 MLC	99.7	18	85.5	£3,098	£3,209	
11	M3JP/KP 180 MLB	145	24.9	88.3	£4,030	£4,158	
15	M3JP/KP 200 MLA	195	30.4	89.9	£5,166	£5,360	
18.5	M3JP/KP 225 SMA	240	40	90.0	£6,177	£6,384	
18.5	M3JP/KP 200 MLB	240	37.1	89.8	£5,935	£6,129	HO
22	M3JP/KP 225 SMB	287	45.5	90.6	£7,202	£7,539	
30	M3JP/KP 250 SMA	389	60.7	91.4	£9,222	£9,671	
30	M3JP/KP 225 SMC	391	61.2	90.7	£8,678	£8,885	HO
37	M3JP/KP 280 SMA	476	73.8	92.7	£11,787	£12,157	
37	M3JP/KP 250 SMB	479	74.2	92.2	£10,425	£10,682	HO
45	M3JP/KP 280 SMB	579	89.3	93.2	£15,940	£16,514	
55	M3JP/KP 315 SMA	707	104	93.4	£18,118	£18,599	
55	M3JP/KP 280 SMC	708	106	93.4	£16,514	£16,838	HO
75	M3JP/KP 315 SMB	966	140	93.7	£22,766	£23,406	
90	M3JP/KP 315 SMC	1159	168	94.0	£26,455	£27,095	
110	M3JP/KP 315 MLA	1419	203	94.0	£30,782	£31,422	
132	M3JP/KP 355 SMA	1694	251	94.7	£35,911	£36,873	
160	M3JP/KP 355 SMB	2053	303	95.2	£43,124	£44,246	
200	M3JP/KP 355 SMC	2570	378	95.3	£54,024	£54,988	
250	M3JP/KP 355 MLB	3213	472	95.4	£73,903	£75,198	
315	M3JP/KP 400 LA	4043	584	96.1	£85,123	£88,328	
315	M3JP/KP 400 LKA	4043	584	96.1	£85,123	£88,328	
355	M3JP/KP 400 LB	4562	641	96.2	£96,023	£99,548	
355	M3JP/KP 400 LKB	4562	641	96.2	£96,023	£99,548	
400	M3JP/KP 400 LC	5134	731	96.3	£99,507	£103,408	
400	M3JP/KP 400 LKC	5134	731	96.3	£99,507	£103,408	
430	M3JP/KP 450 LA	5519	789	95.9	**Price on request**		
470	M3JP/KP 450 LB	6032	861	96.0	**Price on request**		
530	M3JP/KP 450 LC	6793	982	96.1	**Price on request**		
600	M3JP/KP 450 LD	7690	1124	96.3	**Price on request**		

* JP Exd
* KP Exde

HO = High-output design
* Efficiency full load 100%
+ IE2 not applicable to 8-pole

Optional extras for low voltage AC motors

Please note, general performance motors have limited optional extras (see extras marked with*).
Select motor from our process performance range when additional extras are required.

R = On request
S = Standard
N = Not available

Option Description	Modification Code	Motor types	63 £	71 £	80 £	90 £	100 £	112 £	132 £	160 £	180 £	200 £	225 £	250 £	280 £	315 £	355 £	400 £
Auxilliary terminal box	418	●	N	N	N	N	N	N	N	343	343	343	343	343	343	343	343	343
for accessories	418	■	N	343	343	343	343	343	343	343	343	343	343	343	343	343	343	343
	418	▲	N	N	N	N	N	N	N	N	N	457	457	457	457	457	457	457
British Standard sliderails*		●	75	75	75	75	108	108	108	148	148	272	272	456	456	839	839	839
		■	N	75	75	75	108	108	108	148	148	272	272	456	456	839	839	839
		▲	N	N	75	75	108	108	108	148	148	272	272	456	456	839	839	839
Degree of Protection IP56*	403	●	232	232	232	232	232	289	289	331	331	331	331	331	331	363	383	441
	403	■	232	232	232	232	232	289	289	331	331	331	331	331	331	363	383	441
	403	▲	N	N	232	232	232	289	289	331	331	331	331	331	331	363	383	441
Degree of Protection IP65	158	●	232	232	232	232	232	294	294	375	375	375	375	375	330	363	383	441
	158	■	N	232	232	232	232	294	294	375	375	375	375	375	330	363	383	441
	158	▲	N	N	232	232	232	294	294	375	375	375	375	375	R	R	R	R
Exd motor for Gas Group IIC	461	▲	N	N	86	103	134	168	217	341	591	842	1095	1346	1961	3266	6528	9791
External earth bolt*	67	●	66	66	66	66	66	66	66	115	115	115	115	115	112	112	112	112
	67	■	N	100	100	100	100	100	100	115	115	115	115	115	112	112	112	112
	67	▲	N	N	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Foot and face mounting*	8	●	122	122	122	122	122	159	159	N	N	N	N	N	N	N	N	N
	8	■	N	88	88	88	88	128	N	N	N	N	N	N	N	N	N	N
	8	▲	N	N	79	79	79	110	140	N	N	N	N	N	N	N	N	N
Foot and flange mounting*	9	●	122	122	122	122	122	159	159	303	303	402	402	440	379	656	1146	1472
	9	■	N	88	88	88	88	128	128	268	268	358	358	390	379	656	1146	1472
	9	▲	N	N	79	79	79	110	140	268	268	358	358	391	379	656	1146	1472
Frequency converter rating	163	●	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67
plate. Rating data according	163	■	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67
to quotation	163	▲	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67
Heating element specify	450/451	●	220	220	220	220	220	246	246	297	329	366	418	502	447	447	500	500
120V or 240V*	450/451	■	N	220	220	220	220	246	246	297	329	366	418	502	447	447	500	500
	450/451	▲	N	N	220	220	220	246	246	297	329	366	418	502	447	447	500	500
Insulated bearing at NDE.	701	●	R	R	R	R	R	R	R	R	R	R	R	R	1063	1063	1472	1472
Frame 280 and above on	701	■	R	R	R	R	R	R	R	R	R	R	R	R	1063	1063	1472	1472
variable speed drives.*	701	▲	R	R	R	R	R	R	R	R	R	R	R	R	1063	1063	1472	1472
Metal fan	68	●	141	141	141	141	141	198	198	285	285	307	322	322	518	555	591	591
	68	■	N	136	136	136	136	196	196	253	253	270	285	285	518	555	591	591
	68	▲	N	N	134	159	159	168	168	253	253	270	285	285	518	555	591	591
Metal fan cover	53	●	94	94	94	94	94	131	129	S	S	S	S	S	S	S	S	S
	53	■	N	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
	53	▲	N	N	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Paint colour to standard RAL	114	●	202	202	202	202	202	198	198	242	242	242	242	242	235	235	235	235
specify RAL no.*	114	■	N	202	202	202	202	200	200	242	242	242	242	242	235	235	235	235
	114	▲	N	N	202	202	202	200	200	242	242	242	242	242	235	235	235	235
PT100 resistance element	445	●	N	N	N	N	N	598	598	587	587	869	869	869	819	819	819	819
one per phase	445	■	N	R	R	R	R	598	598	587	587	869	869	869	819	819	819	819
	445	▲	N	N	598	598	598	598	598	587	587	869	869	869	819	819	819	819
PTC thermistors 3 in series,	436	●	123	123	123	123	123	159	159	232	232	232	232	232	200	200	200	200
150°C others on request*	436	■	N	123	123	123	123	159	159	232	232	232	232	232	200	200	200	200
	436	▲	N	N	123	123	123	159	159	232	232	232	232	232	200	200	200	200

Optional extras for low voltage AC motors

Please note, general performance motors have limited optional extras (see extras marked with*).
Select motor from our process performance range when additional extras are required.

R = On request
S = Standard
N = Not available

Option Description	Modification Code	Motor types	63 £	71 £	80 £	90 £	100 £	112 £	132 £	160 £	180 £	200 £	225 £	250 £	280 £	315 £	355 £	400 £
Rain canopy for VI mounting	5	●	104	104	104	104	104	119	119	136	157	165	221	273	329	388	579	579
(mandatory on Ex motors)*	5	■	N	N	104	104	104	119	119	136	157	165	221	273	329	388	579	579
	5	▲	N	N	104	104	104	119	119	136	157	165	221	273	329	388	579	579
Restamping voltage,	2	●	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48
frequency and output,	2	■	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48
continuous duty*	2	▲	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48
Roller bearing at DE	37	●	N	N	N	N	N	N	N	242	278	316	364	402	346	346	506	R
(not available on IIC motors)*	37	■	N	N	N	N	N	N	N	242	278	316	364	402	346	346	506	506
	37	▲	N	N	N	N	N	N	N	242	278	316	364	402	346	346	506	506
Separate (Fixed speed)	183	●	N	360	360	360	360	874	874	1085	1236	1733	2037	2376	N	N	N	N
motor cooling fan	183	■	N	R	R	R	952	1144	1427	1530	1530	1530	1800	2100	2272	2858	3103	3346
	183	▲	N	N	N	N	N	N	N	1951	2086	2822	2822	3123	3544	4129	4375	4620
SPM nipples	43	●	N	N	N	N	N	146	146	246	276	308	317	317	310	310	310	310
	43	■	N	N	N	N	N	N	N	246	276	308	317	317	310	310	S	S
	43	▲	N	N	N	N	N	N	N	246	276	308	317	317	310	310	S	S
Test - routine*	148	●	196	196	196	196	196	222	222	222	222	222	222	222	222	222	222	222
	148	■	N	196	196	196	196	222	222	222	222	222	222	222	222	222	222	222
	148	▲	N	N	196	196	196	222	222	222	222	222	222	222	222	222	222	222
Test - Type test report from	145	●	83	83	83	83	83	83	83	83	83	117	117	117	166	166	166	166
test of an identical motor	145	■	N	83	83	83	83	83	83	83	83	117	117	117	166	166	166	166
(where available)*																		

Alloy ●
Cast Iron ■
Flameproof ▲

High voltage process performance motors

ABB has developed a high voltage induction motor that can be offered with a short delivery time. The motor is ideal for the serial OEM who requires a standard product, the electrical and mechanical properties of which do not need to be altered.

The high voltage process performance motor utilises a combination of ABB high voltage motor design expertise and the proven platform of ABB low voltage cast iron motors. The result is a motor with:

- a straightforward design
- significantly lower price than that of an engineered motor
- a standardised ordering process that ensures a short delivery time
- Shaft heights IEC 315 to 450
  - 110 kW to 750 kW at 50 Hz
  - 3 kV to 10 kV
- NEMA frames 506AT to 728
  - 150 hp to 950 hp (SF 1.15) at 60 Hz
  - 4 kV (star-connected stator), 2.3 kV (delta-connected stator)
- Rib-cooled cast iron frame (IP55 / IC411 / TEFC)
- 2 to 8 poles
- Horizontal foot mounted, horizontal foot and flange mounted and vertical flange mounted
- IEC, NEMA, CSA

HV process performance cast iron motors, 315-450, 2 & 4 poles

TEFC high voltage motors, cast iron frame, IP 55, IC411, single-speed, ambient temperature 40°C
See product catalogues or **www.abb.com/motors&generators** for more information on products.

Output kW 3000 r/min = 2 poles	Type	Foot-mounted Product code 3300V 50Hz	B3 Price
160	M3BM 315 LKA	3GBM 311811-ARA	£44,884
200	M3BM 355 LKA	3GBM 351811-ARA	£46,094
250	M3BM 355 LKB	3GBM 351821-ARA	£48,967
315	M3BM 355 LKC	3GBM 351831-ARA	£55,091
335	M3BM 355 LKD	3GBM 351841-ARA	£59,575
355	M3BM 400 LA	3GBM 401510-ARA	£63,230
400	M3BM 400 LB	3GBM 401520-ARA	£67,341
445	M3BM 400 LC	3GBM 401531-ARA	£70,992
500	M3BM 400 LKA	3GBM 401810-ARA	£74,052
560	M3BM 400 LKB	3GBM 401820-ARA	£78,191

3 kV, 6 kV, 6.6 kV and 10 kV options available on request.

Output kW 1500 r/min = 4 poles	Type	Foot-mounted Product code 3300V 50Hz	B3 Price	Vertical Product code	V1/B35 Price
132	M3BM 315 LKA	3GBM 312810-ARA	£42,038	3GBM 312810-BRA	£43,298
160	M3BM 315 LKB	3GBM 312820-ARA	£42,842	3GBM 312820-BRA	£44,102
200	M3BM 315 LKC	3GBM 312831-ARA	£44,881	3GBM 312831-BRA	£46,142
250	M3BM 355 LKA	3GBM 352810-ARA	£48,565	3GBM 352810-BRA	£50,177
315	M3BM 355 LKB	3GBM 352820-ARA	£52,245	3GBM 352820-BRA	£53,856
355	M3BM 355 LKC	3GBM 352830-ARA	£54,660	3GBM 352830-BRA	£56,276
400	M3BM 355 LKD	3GBM 352841-ARA	£57,938	3GBM 352841-BRA	£59,550
450	M3BM 400 LA	3GBM 402510-ARA	£61,589	3GBM 402510-BRA	£63,551
500	M3BM 400 LB	3GBM 402520-ARA	£66,102	3GBM 402520-BRA	£68,065
560	M3BM 400 LKA	3GBM 402810-ARA	£71,412	3GBM 402810-BRA	£73,374
630	M3BM 400 LKB	3GBM 402820-ARA	£79,021	3GBM 402820-BRA	£80,983
630	M3BM 450 LA	3GBM 452510-ARA	£79,021	3GBM 452510-BRA	£81,170
710	M3BM 450 LB	3GBM 452520-ARA	£89,794	3GBM 452520-BRA	£91,944

3 kV, 6 kV, 6.6 kV and 10 kV options available on request.

HV process performance cast iron motors, 315-450, 6 & 8 poles

TEFC high voltage motors, cast iron frame, IP 55, IC411, single-speed, ambient temperature 40°C
See product catalogues or **www.abb.com/motors&generators** for more information on products

Output kW	Type	Foot-mounted Product code	B3 Price	Vertical Product code	V1/B35 Price
1000 r/min = 6 poles		3300V 50Hz			
112	M3BM 315 LKA	3GBM 313811-ARA	£47,465	3GBM 313811-BRA	£48,726
132	M3BM 315 LKB	3GBM 313820-ARA	£48,083	3GBM 313820-BRA	£49,343
150	M3BM 315 LKC	3GBM 313831-ARA	£48,671	3GBM 313831-BRA	£49,931
160	M3BM 355 LKA	3GBM 353810-ARA	£49,694	3GBM 353810-BRA	£51,305
200	M3BM 355 LKB	3GBM 353820-ARA	£52,165	3GBM 353820-BRA	£53,776
250	M3BM 355 LKC	3GBM 353830-ARA	£56,221	3GBM 353830-BRA	£57,833
315	M3BM 400 L	3GBM 403500-ARA	£66,424	3GBM 403500-BRA	£68,386
355	M3BM 400 LA	3GBM 403510-ARA	£68,899	3GBM 403510-BRA	£70,861
400	M3BM 400 LB	3GBM 403520-ARA	£73,357	3GBM 403520-BRA	£75,319
450	M3BM 400 LKA	3GBM 403811-ARA	£77,519	3GBM 403811-BRA	£79,482
500	M3BM 400 LKB	3GBM 403821-ARA	£81,390	3GBM 403821-BRA	£83,351
530	M3BM 400 LKC	3GBM 403831-ARA	£84,021	3GBM 403831-BRA	£85,983
560	M3BM 450 LA	3GBM 453510-ARA	£86,652	3GBM 453510-BRA	£88,801
630	M3BM 450 LB	3GBM 453520-ARA	£92,185	3GBM 453520-BRA	£94,333
710	M3BM 450 LC	3GBM 453530-ARA	£99,304	3GBM 453530-BRA	£101,452

3 kV, 6 kV, 6.6 kV and 10 kV options available on request.

Output kW	Type	Foot-mounted Product code	B3 Price	Vertical Product code	V1/B35 Price
750 r/min = 8 poles		3300V 50Hz			
200	M3BM 400 LA	3GBM 404510-ARA	£60,815	3GBM 404510-BRA	£62,777
220	M3BM 400 LB	3GBM 404520-ARA	£64,466	3GBM 404520-BRA	£66,428
250	M3BM 400 LC	3GBM 404530-ARA	£68,577	3GBM 404530-BRA	£70,539
280	M3BM 400 LD	3GBM 404540-ARA	£72,630	3GBM 404540-BRA	£74,592
300	M3BM 400 LE	3GBM 404550-ARA	£77,519	3GBM 404550-BRA	£79,482
315	M3BM 400 LKA	3GBM 404810-ARA	£80,286	3GBM 404810-BRA	£82,248
355	M3BM 400 LKB	3GBM 404820-ARA	£84,182	3GBM 404820-BRA	£86,143
375	M3BM 400 LKC	3GBM 404830-ARA	£86,546	3GBM 404830-BRA	£88,508
400	M3BM 450 LA	3GBM 454510-ARA	£89,448	3GBM 454510-BRA	£91,596
450	M3BM 450 LB	3GBM 454520-ARA	£94,202	3GBM 454520-BRA	£96,350
500	M3BM 450 LC	3GBM 454530-ARA	£98,471	3GBM 454530-BRA	£100,619
530	M3BM 450 LD	3GBM 454540-ARA	£101,131	3GBM 454540-BRA	£103,279

3 kV, 6 kV, 6.6 kV and 10 kV options available on request.

Optional extras for high voltage motors

Note: certain variant codes cannot be used together
Please see product catalogues for more variants.

R = On request
S = Standard

Code	Variant	315 Price	355 Price	400 Price	450 Price
Bearings and lubrication					
107	RTD Pt-100 in each bearing, 3-wire	£593	£593	£593	£593
037	Roller bearing at D-end, inc. 036 Transport lock (not available for 2-pole)	£1,185	£1,426	£1,426	£1,481
	SPM nipple (for shock pulse measuring) in each bearing	S	S	S	S
654	Provision for vibration sensors (M8 x 1 thread)	£1,477	£1,477	£1,477	£1,477
Coupling					
035	Assembly of customer supplied coupling-half	£2,902	£2,902	£2,902	£2,902
Heating elements					
450	Heating element 100-120V - 1ph	£483	£483	£483	£483
451	Heating element 200-240V - 1ph	£483	£483	£483	£483
Packing / Seaworthy packing					
	Seaworthy packing	£4,298	£4,298	£4,298	£4,298
Painting					
114	Special paint colour, customer specified RAL grade	£1,261	£1,261	£1,261	£1,261
Protection					
005	Metal protective roof (rain canopy), vertical motor, shaft down	£2,175	£2,175	£2,175	£2,175
158	Degree of protection IP65	£644	£644	£644	£644
403	Degree of protection IP56	£644	£644	£644	£644
Rating & instruction plates					
002	Restamping output and voltage, continuous duty	£161	£161	£161	£161
Stator winding temperature sensors					
	RTD Pt-100 (6 pcs) inside stator slots, 3-wire	S	S	S	S
Terminal box					
447	Top mounted separate auxiliary terminal box for heating elements	£932	£932	£932	£932
750	Star point terminal box (not available for V1)	£1,908	£1,908	£1,908	£1,908
Testing					
	Routine test report	S	S	S	S
146	Type test with report for motor from specific delivery batch	£8,300	£8,300	£8,300	£8,300
147	Type test with report for motor from specific delivery batch, customer witnessed	£9,751	£9,751	£9,751	£9,751
762	Noise level test	£2,957	£2,957	£2,957	£2,957
Foundation and installation					
	Slide rails (2 pcs) for belt drives	£2,632	£2,632	£2,632	£2,632

NEMA motors

General purpose industrial motors
Three phase, totally enclosed, foot mounted
– 1/8 – 400 hp
– NEMA 42 – 449T

Applications
Pumps, compressors, fans, conveyors, machine tools and other general purpose three-phase applications.

Features
Suitable for mounting in any position. Ball bearings, heavy-gauge steel and cast-iron frames, and gasketed conduit boxes. Class F insulation, 1.15 service factor, low-loss electrical grade lamination steel. EM Super-E® motors have NEMA Premium® efficiency and three years warranty. Motors with TR suffix have roller bearings for heavy belted loads.

Severe duty motors
Three phase, totally enclosed, foot mounted
– 1 – 400 hp
– NEMA 143T – 449T

Applications
Petrochemical plants, mines, foundries, pulp and paper plants, waste management facilities, chemical plants, tropical climates and other processing industry applications requiring protection against corrosion caused by severe environmental operating conditions.

Features
ECP motors are XEX designs. 1.15 service factor, corrosion resistant epoxy finish, regreasable ball or roller bearings, oversized rotatable cast iron conduit box, cast iron frames, V-ring shaft seal, moisture resistant copper windings. Class F insulation, stainless steel nameplate and corrosion resistant hardware. ECP/XEX Super-E® motors have NEMA Premium® efficiency and three years warranty. Positive lubrication system (PLS) on 360 frames and larger.

Explosion proof motors
Single and three phase, foot mounted
– 1/4 – 300 hp
– NEMA 48 – 449T

Applications
Ideal for use where hazardous fumes or dust may be present.

Features
UL and CSA approved for Division 1, Class I, Group D; Class I, Group D, Class II Group F & G; Class I, Group C & D, Class II, Group F & G. Corrosion resistant epoxy finish. Shipped with U.L. and CSA approved cast conduit box assembled to each motor. 1.00 service factor. EM Super-E® explosion proof motors have NEMA Premium® efficiency and three years warranty.

Gearings

For well over a century, Dodge products have helped manufacturers, OEMs, and producers increase the productivity and profitability of their operations.
ABB is excited to bring the history and innovation of Dodge mechanical power transmission products to our portfolio.

ABB's commitment includes adding new warehouse space to stock Dodge MPT products, which ensures they are quickly accessible when you need them. Experts in the products and industries we serve will also be added to promote the products and serve our customers.

Torque-Arm II

- All reducers can be shaft mounted: screw conveyor, vertical, and flange mounted
- Kilowatt ratings through 294 kW
- Torque ratings through 56,500 Nm
- Standard 5, 9, 15, 25, and up to 40:1 gear ratios
- Nearly 300:1 speed reduction with V-belt drives
- Twin-tapered bushing bores: 25 mm through 160 mm
- Highly efficient helical gearing
- Meets or exceeds AGMA standards, including 5,000 hours L10 life and 25,000 average hour life
- New heavy duty lip seals for extended wear life, -40 to 138°C
- 100 percent factory noise and leak tested
- New metal shield sealing system with excluder lip
- AGMA output torque ratings up to 56,500 Nm

Quantis

- Inline helical (ILH), right angle helical bevel (RHB), motorised shaft mount (MSM)
- Output ratings 0.75 kW to 56 kW; up to torque 14,000 Nm
- Ratios, 1.5:1 - 300:1
- 8 case sizes per housing configuration, clamp collar, 3-piece coupled, integral gearmotor, separate input. Solid, straight hollow output – ILH/MSM efficiency of 98 percent per stage, RHB efficiency of 95 percent per stage
- All units shipped filled with oil from the factory and are installation ready
- Optional XT harsh duty seal for operation in wet and dirty environments
- Class 30 gray iron housings cast with internal ribbing for added strength
- Options include washdown and screw conveyor configurations

MagnaGearXTR®

- Parallel shaft or right angle configurations available
- Torque capacities from 32 to 104 kNm available
- Global product design to fit all markets
- Multiple mounting configurations available (base mounting, swing base mounting, tunnel housings)
- Can be used with a variety of soft start mechanisms including VSD and fluid couplings

Mounted bearings

Mounted ball bearings

When it comes to reliable service and low maintenance, ABB Dodge® mounted ball bearings are unmatched in the industry. ABB Dodge mounted ball bearings are available in any of our proven locking devices: our exclusive 65° setscrew locking system, our patented Grip Tight adapter mounted, eccentric locking collars and D-Lok™ concentric clamp locking system mounted ball bearing.

Setscrew ball Bearings

- Superior 65° locking setscrew
- DualGuard seal – comprised of single lip seal and rubberised flinger
- Stronger, more flexible bearing cage
- Optimum balance between locking forces
- Heat stabilised nylon construction with and inner ring stress fiber-glass reinforcement
- Secure fit to the shaft

Grip Tight® ball bearings

- Two types: normal duty GT and medium duty GTM
- DualGuard seal – comprised of single lip seal and rubberised flinger
- Thin wall adapter mounting offers 360° full shaft contact and concentricity. No shaft
- Marring or fretting corrosion like setscrew and eccentric collar products. Integral dismount feature easily removes the bearing from the shaft. Turned, ground, and polished shafting is not required
- Anti-rotation device prevents insert rotation associated with heavy loads, vibration, unbalanced loads, and high-speed applications
- High-temperature option available to 204 °C
- Plus or minus 2° static misalignment

Ultra Kleen®, E-Z Kleen®

- Reinforced polymer and stainless steel housings
- Patented polymer housing includes antimicrobial agent which resists bacterial and fungus growth - two inserts: corrosion resistant and stainless steel insert
- Three locking devices: 65° setscrew angle (SC), Grip Tight adapter mount and concentric clamp collar (D-Lok).
- Quadguard seal: comprised of our triple lip seal and rubberised flinger. Additional grease retention provided by the maxlife cage
- Anti-rotation device prevents insert rotation associated with heavy loads, vibration, unbalanced loads, and high-speed applications - plus or minus 2° static misalignment

Mounted bearings

Roller bearings

For decades, industry's leading producers have depended on ABB Dodge® roller bearings to handle their conveyance and power transmission needs. Dodge bearings offer innovative designs; a wide range of shaft attachment methods, rolling elements, housings, and seal choices, patented features and consistent performance.

ISN spherical roller bearings

- Industry's only push/pull adapter mount system
- Available in two-bolt pillow blocks
- Accepts commercial shaft tolerances
- Installation and removal in fewer than 15 minutes
- Fully concentric shaft attachment with adaptor sleeve mount
- Virtually eliminates fretting corrosion
- Capable of withstanding static or dynamic misalignment of ±1° - shaft-ready out of the box - available with Trident triple lip or labyrinth seal options
- Sizes range from 30 mm through 170 mm
- SN mounting dimensions

Type E-xtra® tapered roller bearings

- Tapered rolling elements
- Completely assembled, factory adjusted, and properly lubricated
- Shaft ready
- Extra protection
- E-Tect seal option - comparable mounting dimensions with ball bearings
- E-xtra allows easy upgrade from ball bearings

Couplings

Elastomeric, sleeve style - Dodge D-Flex couplings

Three-way flexing action handles shock, vibration, and misalignment. The ABB Dodge D-Flex™ coupling features moulded, non-lubricated, interchangeable elastomeric sleeves of EPDM, neoprene, or Hytrel. Its three-way flexing action accommodates torsional, angular, and parallel misalignment, as well as axial end float.

Elastomeric, tyre style - Dodge Para-Flex

Superior design provides advantages over other rubber or polyurethane elements.

ABB Dodge Para-Flex elements are manufactured with reinforcing fabric tension cords that transmit much of the torque during operation.

The uniform and centred bead in the foot of the tyre element prevents it from pulling out during operation. Additionally, the tyre element is reinforced at the split to reduce fatigue and extend life.

Industry leading misalignment capabilities.

ABB Dodge Para-Flex elements provide accommodation of shaft misalignment during installation, running-time and replacement better than other elastomeric elements.

With an industry-leading combined 4° angular, 3.17 mm (1/8 in.) parallel, and 7.93 mm (5/16 in.) end-float capability, Para-Flex couplings will perform in difficult applications and reduce valuable time needed for installation and maintenance.

Couplings

Metallic, grid style - Dodge Grid-Lign

Compact in size, yet high in torque capability. ABB Dodge Grid-Lign couplings are available in a variety of sizes, in standard and spacer styles. Every coupling features two steel shaft hubs, a tapered grid element, two seals and a cover assembly. Its versatile design allows for a motor or reducer output speed connection, and its speed capability ranges up to 6,000 rpm dependant on size. ABB Dodge Grid-Lign is also available in both T31 and T35 spacer designs up to size 1200T. This spacer offering can be used as a spacer coupling, or mounted to a brake disc or drum.

Flexible tapered element - The ABB Dodge Grid-Lign coupling's tapered grid element is engineered with high-strength, spring steel that is quenched and tempered. This feature helps isolate vibration and cushions shock loads. In addition, it allows uniform contact during light, normal and shock-loading conditions for long machine life.

High torque capability - Torque capabilities on the ABB Dodge Grid-Lign coupling range up to 800,000 Nm (7 million lb-in) dependant on size. Whether it is overland conveyors or underground mines, the high torque ratings allow for customers to specify a Grid-Lign coupling in the largest conveyor applications.

A quick guide to supply voltages and frequencies worldwide

Country	Frequency Hz	Industrial Voltage in common use (V)
AFRICA		
Algeria	50	415/230, 380/220
Angola	50	380/220
Botswana	50	400/230
Burkina Faso	50	380/220
Burundi	50	380/220
Cameron	50	380/220
Central African Rep	50	380/220
Chad	50	380/220
Congo Rep.	50	380/220
Congo Dem. Rep.	50	380/220
Egypt	50	380/220
Ethiopia	50	380/220
Gambia	50	400/230
Ghana	50	415/240, 400/230
Guinea	50	440/220, 380/220
Guinea-Bissau	50	220/110
Ivory Coast	50	380/220
Kenya	50	415/240, 380/220
Lesotho	50	380/220
Libya	50	400/230
Malawi	50	400/230, 380/220
Morocco	50	400/230, 380/220
Mozambique	50	380/220
Namibia	50	220
Nigeria	50	415/240, 380/220
Rwanda	50	400/230
Senegal	50	400/230
Sierra Leone	50	400/230
South Africa*	50	500, 400/230, 380/220
Sudan	50	400/230
Tanzania	50	400/230
Tunisia	50	400/230
Uganda	50	415/240
Zaire	50	415, 380/220
Zambia	50	400/230
Zimbabwe	50	400/230

Country	Frequency Hz	Industrial Voltage in common use (V)
MIDDLE EAST		
Bahrain	50	400/230, 380/220
Iraq	50	400/230
Israel	50	415, 400/230, 280/220
Jordan	50	400/230, 380/220
Kuwait	50	415/240
Lebanon	50	380/220
Oman	50	415/240
Qatar	50	415/240
Saudi Arabia	50, 60	440/220, 400/230, 380/220
Syria	50	380/220
United Arab Emirates	50	415/220
ASIA		
Afghanistan	50	380/220
Armenia	50	380/220
Azerbaijan	50	380/220
Bangladesh	50	380/220
Bhutan	50	400/230
Cambodia	50	380/220
China*	50	380/220
Hong Kong	50	380/220
India*	50	415/240, 400/230
Indonesia	50	380/220
Iran	50	400/230, 380/220
Japan	50, 60	440/220, 400/200
Kazakhstan	50	380/220
Korea North	60	380/220
Korea South	60	440, 380/220
Laos	50	380/220
Malaysia	50	415/240
Myanmar (Burma)	50	400/230
Nepal	50	400/230
Pakistan	50	415/240, 400/230
Philippines	60	440, 220/110
Singapore	50	415/240
Sri Lanka	50	400/230, 380/220
Taiwan R.O.C.	60	440, 380/220
Thailand	50	380/220
Vietnam	50	380/220

A quick guide to supply voltages and frequencies worldwide

Country	Frequency Hz	Industrial Voltage in common use (V)
OCEANIA		
Australia	50	415/240
Fiji	50	415/240
New Zealand	50	415/240, 400/230
NORTH AMERICA		
Canada	60	600, 575, 460/230
USA	60	460/230
CENTRAL & SOUTH AMERICA		
Antigua	60	480, 460, 440, 230, 230/460, 220
Argentina	50	660, 380, 220
Aruba	60	480, 460, 440, 230, 230/460, 220
Bahamas	60	480, 460, 440, 230, 230/460, 220
Barbados	50	480, 460, 440, 230, 230/460, 220
Belize	60	480, 440, 240, 220
Bermuda	60	480, 460, 440, 230, 230/460, 220
Bolivia	50	480, 440, 220/380
Brazil	60	690, 480, 460, 440, 380/660, 220/380/440, 280/380
Chile	50	690, 575, 460, 380/660, 380/220
Colombia	60	230/480, 230/460, 220/440, 110/220
Costa Rica	60	480, 440, 240, 220
Cuba	60	480, 460, 440, 230, 230/460, 220
Ecuador	60	660, 480, 460, 220/440
El Salvador	60	480, 440, 240, 220
Guatemala	60	480, 440, 240, 220
Guyana	60	480, 460, 440, 230, 230/460, 220
Haiti	60	480, 460, 440, 230, 230/460, 220
Honduras	60	480, 440, 240, 220
Jamaica	60	480, 460, 440, 230, 230/460, 220
Mexico	60	440/220
Nicaragua	60	480, 440, 240, 220
Panama	60	480, 440, 240, 220
Paraguay	50	660, 380, 220
Peru	60	690, 480, 460, 440, 380, 220, 220/440
Uruguay	50	500, 380/690, 220/380
Venezuela	60	480, 460, 440, 230, 230/460, 220

Country	Frequency Hz	Industrial Voltage in common use (V)
EUROPE		
Andora	50	400/230, 380/220
Austria	50	690, 400/230
Belarus	50	380/220
Belgium	50	400/230
Bosnia-Herzegovina	50	380/220
Bulgaria	50	380/220
Cyprus	50	415/240, 400/230
Croatia	50	400/230, 380/220
Czech Rep	50	690, 400/230, 380/220
Denmark	50	400/230
Estonia*	50	380/220
Finland*	50	690, 500, 400/230
France	50	400/230, 380/220
Germany	50	690, 400/230
Greece	50	400/230, 380/220
Hungary	50	400/230, 380/220
Iceland	50	400/230, 380/220
Ireland	50	400/230, 380/220
Italy*	50	400/230, 380/220
Latvia	50	380/220
Liechtenstein	50	400/230
Lithuania	50	380/220
Luxembourg	50	400/230, 380/220
Macedonia	50	220
Malta	50	415/240
Monaco	50	400/230, 380/220
Montenegro	50	400-690
Netherlands	50	500, 400/230
Norway	50	690, 500, 400/230
Poland	50	400/230, 380/220
Portugal	50	400/230, 380/220
Romania	50	400/230, 380/220
Russia*	50	380/220
Serbia	50	380
Slovakia	50	400/230, 380/220
Slovenia	50	400/230, 380/220
Spain*	50	400/230, 380/220
Sweden*	50	690, 500, 400/230
Switzerland	50	690, 500, 400/230
Turkey	50	230/400
Ukraine	50	380/220
United Kingdom	50	690, 415/240, 400/230, 380/220

*Manufacturing sites

Useful engineering information

Reference information and explanation of abbreviations

Degrees of protection

As defined by IEC 34-5 and BS 4999 pt 105, the code generally consists of 'IP' followed by two digits: the first describing the protection against solid bodies or protection to persons against contact with live or moving parts inside the enclosure; the second describing the protection against ingress of water.

First Digit	Meaning (Protection Against)	Second Digit	Meaning (Protection Against)
0	Not protected	0	Not protected
1	50mm dia. body	1	Vertical drips
2	12mm dia. body	2	Drips up to 15° from vertical
3	2.5mm dia. body	3	Drips up to 60° from vertical
4	1mm dia. body	4	Splashing from any direction
5	Dust protected	5	Water jets from any direction
6	Dust tight	6	Heavy seas (Does not cover corrosion resistance, etc)
		7	Effects of immersion

NOTE: IP66 does not imply outdoor use, it is merely a statement of ingress protection against water and dust, outdoor mounting has to combat the effects of heat, humidity and direct sunlight.

Cooling forms

As defined by IEC 34-6 and BS 4999 pt.106, the code generally consists of 'IC' followed by two digits; the first describing the cooling circuit arrangement; the second describing the method of supplying power to circulate the coolant. Where more than one cooling circuit is in use, these may be expressed as 'IC' followed by groups of two digits, e.g. IC0141.

The following forms are used in this catalogue:

IC410 – Typical examples are roller table motors
IC411 – Standard motors
IC416 – Standard motors (normally bigger frame sizes only equipped with auxilliary fan)
IC418 – Fan application motors without a cooling fan, cooled by the air stream of the driven machine
IC01 – Open drip-proof motors
IC31W – Water cooled motors

Mounting forms

The arrangements are defined by IEC 34-7, BS 4999 pt. 107 code II (and DIN 42950). The following forms are used in this catalogue and are for motors with two bearings housed in end-shields. When flange mounting they have access to the back of the flange.

IM1001 (B3) Horizontal foot mounted
IM1011 (V5) Vertical foot mounted
IM3001 (B5) Horizontal flange mounted
IM3011 (V1) Vertical flange mounted
IM2001 (B35) Horizontal foot & flange mounted
IM1071 (B8) Horizontal foot, ceiling mounted

Note for gearbox users – service factor

The geared motors covered by this catalogue are rated for driven machines with a uniform load for continuous duty or occasional moderate shock loading on single-shift operation, being known as a Unity Service Factor. For applications with short-time duty, high inertia or heavy shock loads, advice should be sought on calculating the correct service factor and selecting the most suitable gearbox type.

Abbreviations

Electrical data

Kilowatt	= kW
Volts	= V
Armature Volts	= Va
Field Volts	= Vf
Amperes	= A
Armature Current	= Ia
Field Current	= If
Power factor	= PF

Useful conversion factors

1hp	= 746W
1Nm	= 8.851 lb.in
1mm	= 0.03937inch
$1m^2$	= $10.765ft^2$
$1kg.m^2$	= $1Nms^2$ = $0.73752 lb.ft^2$

Useful formulae

1 Watt = 1 Nm/s

Torque (lb ft) $= \frac{5250 \times hp}{speed\ (rpm)}$

Torque (Nm) $= \frac{9550 \times kW}{speed\ (rpm)}$

3 phase AC power (kW) $= \frac{1.732 \times V \times I \times PF}{1000}$

1 phase AC power (kW) $= \frac{V \times I \times PF}{1000}$

Choosing the right drive for your application

Step	Process	Action
1	**Identify the application** Identify the type of application and the likely demands of the drive	Continue to step 2.
2	**Gather the load data: system inertia, required acceleration and deceleration rates, minimum and maximum speeds, overload requirements, etc.** This information can often be determined by the performance of the existing motor	Continue to step 3.
3	**Gather the motor data: rated torque, kW, volts insulation class, speed, etc.** Whether an existing motor or a new motor is being used, the motor information is critical to choosing a drive	Continue to step 4.
4	**Choose a drive** Match the data gathered in steps 1 to 3 against the table of drive features in the feature finder page xx. Select a drive that meets the motor requirements and has all the software features needed for the application	Continue to step 5.
5	**Is the drive offered in the correct kW/amp rating?** The drive you choose must be able to supply the necessary current to the motor to produce the torque required. This includes normal and overload conditions. Select current from the tables within this catalogue	If yes, continue to step 6. If no, go to step 4. or
6	**Is the drive offered in the correct enclosure and environmental ratings?** The drive you choose must be available in an enclosure style that will withstand the application's environment. It also must produce the required current at the application's altitude and ambient temperature	If yes, continue to step 7. If no, go to step 4. or
7	**Does this drive have the features needed to meet the application's demands?** The drive you choose must have a feature set that matches the application. It also must have sufficient hardware (inputs and outputs, feedback, communications etc.) to perform the application	If yes, continue to step 8. If no, go to step 4. or
8	**Does this drive have the motor control performance to meet the application's demands?** The drive you choose must be able to produce the needed torque at the necessary speeds. It must also be able to control speed and torque depending on the application requirements	If yes, continue to step 9. If no, go to step 4. or
9	**Does the drive have the right user interface?** The drive you choose must interface with the customer correctly, do you need a simple keypad, no keypad or a full text assistant keypad?	If yes, continue to step 10. If no, go to step 4. or
10	**Does the drive have the right level of safety?** The drive you choose could be responsible for the safety in your system after changes in the machinery directive, some ABB drives contain built in safety functionality	If yes, continue to step 11. If no, go to step 4. or
11	**Congratulations!** The ABB AC drive you have chosen has the features and performance needed for a successful application	✓

Please do not hesitate to call ABB if you require assistance selecting your drive and motor

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Power and productivity
for a better world™